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Duplex Plan Reduces Melting Time

Malleable Foundry Doubles Output of Molten Metal Without Increasing Size of Furnace— Large Savings in Cost

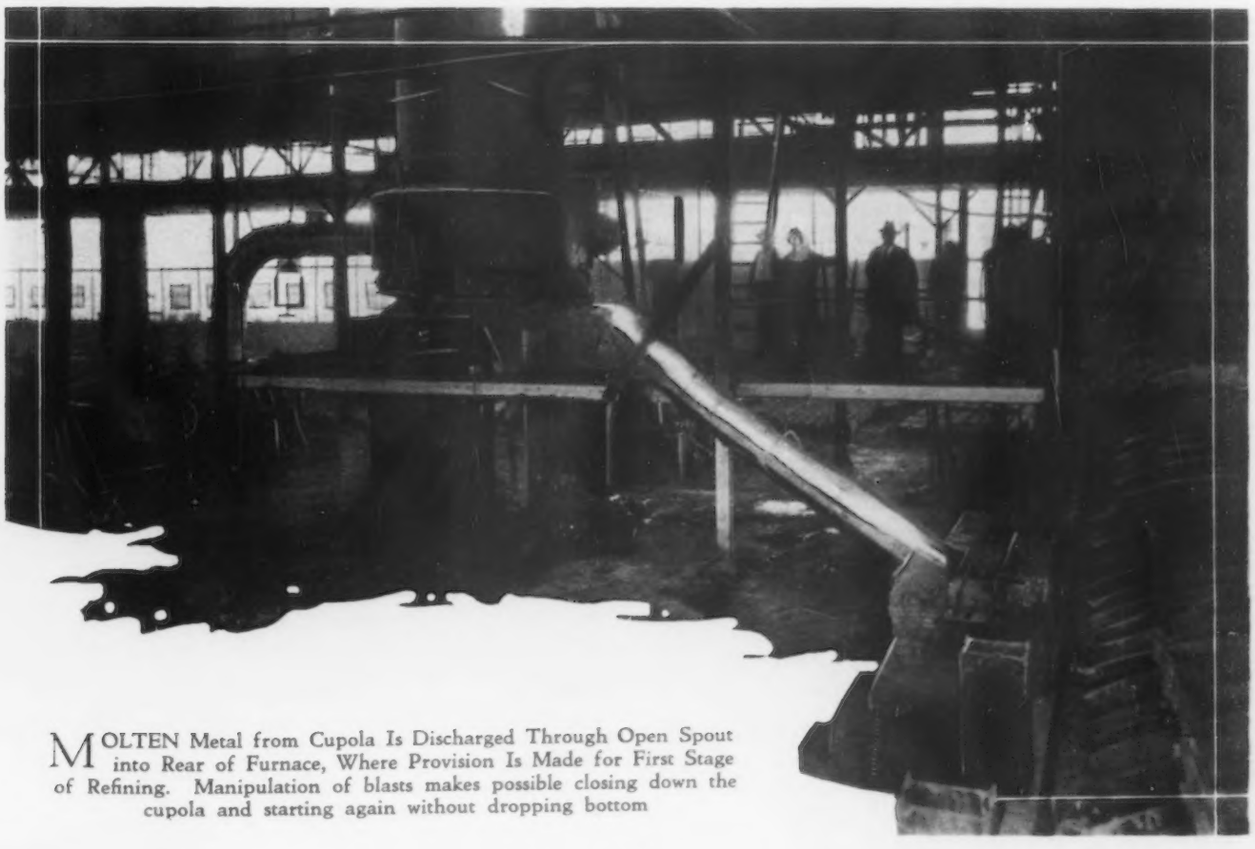
BY BURNHAM FINNEY*

SUBSTANTIAL reductions in melting time, resulting in lowered costs, have been effected at the malleable iron foundry of the Southern Malleable Iron Co., East St. Louis, Ill., by means of a duplex melting system. Although this system has been in operation less than six months, it already has enabled the company to double its output of molten metal without adding to the size of the present air furnace. The saving in melting time makes it possible for the company to put more molders in the same amount of space formerly occupied, the possible tonnage per square foot of molding space thereby being increased.

*Editorial representative of THE IRON AGE at Cincinnati.

Cupola Supplements the Air Furnace

Utilizing the advantages of both the cupola and the air furnace, the duplex system provides for the melting of iron in a cupola and the discharge of the molten metal through an open spout into the rear of the air furnace, where provision is made for the first stage of refining.



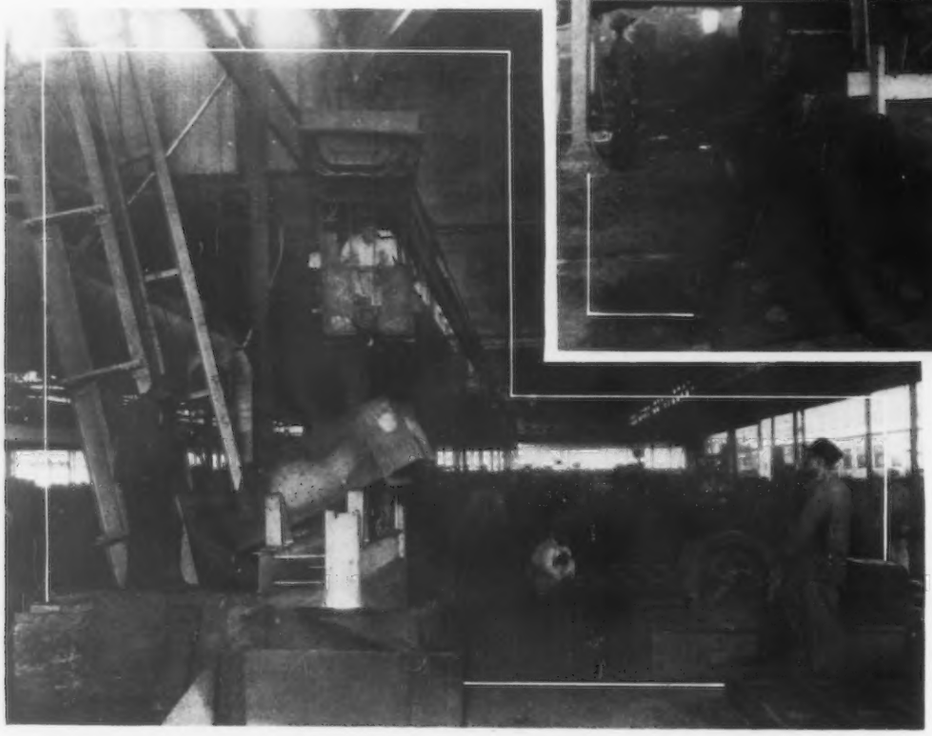
MOLTEN Metal from Cupola Is Discharged Through Open Spout into Rear of Furnace, Where Provision Is Made for First Stage of Refining. Manipulation of blasts makes possible closing down the cupola and starting again without dropping bottom

First tests are made there to determine the percentages of the various elements of the iron.

This zone, known as the first stage of the refining zone, is separated from the main part of the furnace—or the last stage of refining—by a bridge wall consisting of fire-brick and silica sand, the same material which forms the furnace bottom.

In its main construction the cupola does not depart from the usual design. However, by means of the manipulation of blasts, it is possible to close down the cupola, stop melting and start again without dropping the bottom. Upper and lower tuyeres of the cupola are used alternately in order to change the melting zone and bring about proper slagging conditions. The bottom of the cupola is sloped in the same manner as the cupola bottoms in melting gray iron.

At the lower end of the first refining zone is an opening through the side wall connecting with a short spout at the other end of which is an opening in the side wall of the main refining zone. When metal is ready to be transferred from the first to the second refining zone, the operator taps out the metal, using the same method as that in tapping metal from the old-style furnace. This transfer of metal can be made from either or both sides of the furnace in a short time. The ignitable heating mixture for the air furnace enters the main chamber of the furnace through a blowpipe and proper combustion is created by introducing a necessary amount of air from the blower, together with high pressure air through the burner with oil for atomizing purposes. Waste gases pass through the main refining zone, thence through the first refining zone and out a stack. However, these gases can also be forced through a waste heat boiler directly behind the stack, which is connected to the boiler by a fire-brick duct.



CUPOLA Is Charged by Skip Hoist and Container. Container is loaded from large bucket, which is suspended by a hook from electric cab on monorail (above)

Container with Cupola Charge Is Pulled Upward by Cable to Charging Floor

Novel Method of Removing Slag by Steam Jet

Additional means for removing slag is provided by a spout connecting with the first and second refining zones. A steam pipe has been constructed outside the opening through which the metal flows from the first to the second refining zone. The steam from the pipe is directed against the surface of the molten metal as it passes from one zone to the other, forcing the slag back and causing it to pass off a side trough constructed for that purpose, thus leaving the molten metal to flow from the first to the second refining zone more or less clean and free from slag.

The first refining zone is formed by making two inverted V-shaped elevations in the bottom of the air furnace. One of the elevations constitutes not only one end of the first refining zone, but also one end of the second refining zone, the other end of which is provided by an inclined elevation. Mounted on the air blast pipe of the cupola is a small container which is supplied with a suitable desulphurizing compound in powdered form. When the air blast is turned on, the powdered substance is drawn out of the container and into the cupola, where it combines with the material in the usual way to partially free the molten metal from sulphur. At all times there is a

sheet of flame passing through the air furnace as a result of the blast of oil and pulverized coal from the pipe in the wall of the main melting zone, and by means of this the metal is maintained in a highly fluid condition in both the first and second refining zones.

The first and second refining zones may be referred to as both refining and melting zones because, although the metal is in a molten condition when it flows into the first refining zone and is equally so when it passes into the second, there is nevertheless some cooling of the metal as it flows from the cupola to the first refining zone. This is also true of the passage from the first to the second refining zone, but both zones reduce the metal to a more liquid state than when it entered the furnace, and maintain the metal in a high degree of fluidity.

Cupola Charged Like a Blast Furnace

Charging of the cupola is done economically by the use of a skip hoist and container operated much after the fashion of those used with blast furnaces. When resting on the floor of the foundry, the container is close enough to a monorail conveying system so that it can be loaded from a large bucket containing a charge, the bucket being suspended by a hook from an electric cab on the monorail which is operated by a workman. The container is pulled upward by cable until it reaches the charging floor, where its contents are mechanically dumped into the cupola.

That this duplex melting system saves much time in producing malleable castings has been proved by its operation during the past five months. When the air furnace alone is used, a 20-ton heat usually requires about 4½ hr. before the metal is reduced to a molten condition. By means of the duplex system just described the same heat is run in approximately 1 hr. 40 min. Obviously, such a large saving in time brings with it lower production costs.

One of the main purposes in introducing duplex melting, states V. S. Durbin, manager, was to improve the quality of the malleable iron. In recent tests, bars of standard dimensions showed an unusual tensile strength with excellent elongation. The fractures were normal. The high tensile strength of the castings is attributed to the duplex melting system and to the company's method of single heat annealing, described in THE IRON AGE, May 3, 1928, at page 1209.

Country's By-Product Coke Capacity Now 60,328,633 Net Tons

THREE by-product coke plants, comprising 185 ovens, with a coal carbonizing capacity of 1,633,000 net tons of coal annually and a coke yield of 1,143,100 net tons, were completed and placed in operation in 1928, while construction of two other plants involving 109 ovens, with a capacity of converting 899,725 tons of coal into 629,807 tons of coke annually, was started late in the year. THE IRON AGE in its canvass of a year ago showed that the total number of by-product coke ovens built or under construction as of Jan. 1, 1928, was 12,756, with an annual coal carbonizing capacity of 83,826,638 net tons, with a coke yield of 58,555,726 net tons. Additions completed and in progress bring the total number of ovens to 13,050; the annual coal carbonizing capacity to 86,359,363 net tons and coking capacity to 60,328,633 net tons.

The additions to by-product coke oven capacity in the United States completed or started last year are as follows:

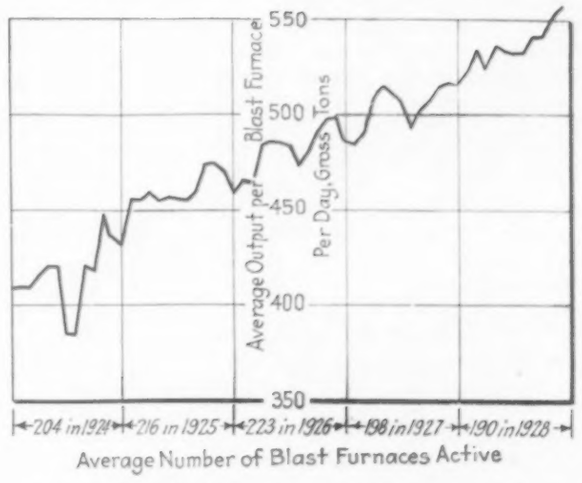
Name and Location	No. of Ovens	Kind of Oven	Annual Capacity Net Tons	
			Coal	Coke
Brooklyn Union Gas Co., Brooklyn	90	Koppers-Becker	800,000	560,000
Central Public Service Corporation, Rockford, Ill.	21	Koppers-Becker	105,000	73,500
Davison Coke & Iron Co., Neville Island, Pittsburgh	35	Koppers-Becker	328,500	229,950
Inland Steel Co., Indiana Harbor, Ind.	74	Koppers-Becker	571,225	399,857
Philadelphia Coke Co., Philadelphia	74	Koppers-Becker	728,000	509,600
Totals	294		2,532,725	1,772,907

Blast Furnace Output One-third Larger Than Five Years Ago

HOW rapidly has been the increased output of the individual blast furnace is indicated in the accompanying diagram. From an average of roughly 400 tons per day per furnace in 1924, output has shown a steady increase until five years later, or in 1928, the individual furnace produced on an average in excess of 525 tons with a maximum reached on Dec. 1 of 560 tons. The curve shows the rate at which pig iron is being produced per stack on the first of each month in each of the five years covered.

On April 1, 1924, there were as many as 270 blast furnaces in operation; on Aug. 1, that year, the number was 144. The highest output per furnace was on Nov. 1, with 448 tons from the 182 furnaces then active.

On March 1, 1925, there were 254 furnaces active, averaging 455 tons apiece; on July 1, there were only 189 furnaces, making 456 tons on the average. On Nov. 1 the unit output was a maximum at 475 tons, with 206 furnaces in blast. In 1926 the number of furnaces active ranged from 213 to 237; in 1927 the range was from 170 to 223; in 1928 it was 169 to 198.



Average Output Per Blast Furnace Has Increased from 400 Tons a Day in 1924 to 525 Tons and More in 1928

Tubing for the British Dirigible

Hardening and Tempering Process Key to Success in Making Tubing from Duralumin and Steel Strip for R 101—How Close Tolerances Were Met

(Special Correspondence)

FOR the ten years since the war Boulton & Paul, Norwich, England, have been developing a form of standardized metal spar and are now completing the design and manufacture of the framework of the new dirigible, R 101. In this airship there are 27 miles of high-tensile steel or duralumin tube, a large number of specially designed junction pieces made from diecast stampings, 11 miles of cable and numerous special fittings in the framework.

In making the tubing for this ship the Norwich company uses its large plant for rolling and drawing steel and duralumin strip into corrugated sections and round tube. Of the two types of tubes used, one is closed and the other has an open-lipped seam, the object of which is to take the duralumin stamped and dished web for the triangular girders of the smaller type in the ship. All of this steel tube is rolled or drawn in the soft state at rates varying from 10 ft. to 3 ft. a minute and then hardened while still on the draw bench.

It is claimed that the process used enables a high-grade tensile steel strip to be used, and insures also a member of even quality throughout, after the various forming processes. Tests on one of the most difficult sizes, from the viewpoint of heat treatment, cut into short lengths, showed the following results:

Range on proof stresses, 64.9 to 68.7 tons (145,400 to 153,900 lb.) per sq. in.

Range on ultimate stress, 88.3 to 93.9 tons (197,800 to 210,300 lb.) per sq. in.

The hardening and tempering process furnishes the key to the whole system. The formed tube is passed through an electric furnace set up on a 70-ft. draw bench, with a very close pyrometer control of temperature. A die is fixed on the entry side of the furnace, the diameter of the bore being such that some, but not too much, friction is offered to the passage of the tube section through it. The furnace is heated to the requisite temperature (about 1050 deg. C. in the case of stainless steel) and a water-cooled die is fitted up in the die-holder of the draw bench. This is a hollow cast iron die through which cold water is constantly flowing.

The tube section is then pulled slowly through the furnace, the first die maintaining just sufficient tension on the section while it is in the furnace to insure straightness of the finished product. The hot section, leaving the furnace, immediately enters the water-cooled die, which completes the quenching and hardening of this section. The speed of the operation is kept constant by watching a speed indicator attached to the draw bench.

The tempering is very similar to the hardening, with, of course, a suitable adjustment of temperature and, in order to speed up the rate of drawing, two furnaces are put in tandem for this process.

Duralumin sheet, being a softer material, is worked more quickly, and strip is turned into tube at rates up to 20 ft. a minute. Of course, no furnace heat treatment is necessary, and the procedure followed is to give the coils of strip a final heat treatment in the salt bath and, after washing, to dip them in a bath of beeswax and tallow. They are then taken direct to the rolling or draw bench, and the flow of work is arranged so that, once the coils leave the salt bath, they are quickly converted into the required section.

Jigs for Stampings a Difficult Problem

The technical work associated with the design and production of the various main joint stampings, which, as all the girders are triangular, had to accommodate three tube ends and provide lugs at varying angles, is in itself a noteworthy achievement, for, while the stampings were generally similar throughout the vessel, the dimensions varied over a wide angular range. The jigs consequently had to be made to reproduce geometric conditions of rotation around two principal axes, and it was necessary also to hold the work in such a manner as to minimize distortion due to removal of large amounts of metal.

This has been accomplished quite ingeniously, and one jig alone for a main joint stamping can be varied over 20 changes of angles in one plane and about the same number in a plane at right angles to the first. Further jigs have been designed for practically all parts, as there is much repetition work in the airship, subject to the minute variations of angle mentioned, and the jigging process has also been carried to the main girder and frame assembly.

The value of this proved itself when the erection stage was reached, for the components went together perfectly and no part had to be rejected for a dimensional error.

Methods Compared for Determining Gases in Steels

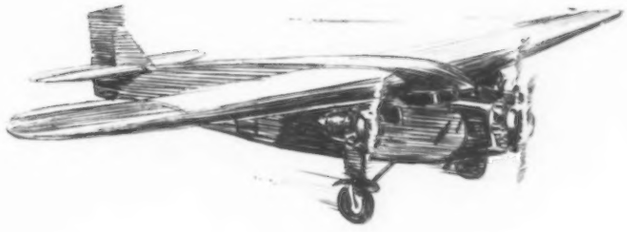
Considerable work has been done in recent years on the accurate determination of gas in metals. A comparison of the various methods used in different steel producing countries has been made by the United States Bureau of Standards by preparing a uniform sample of ingot iron and distributing it to a few investigators. The iron contained 0.04 per cent carbon, 0.03 per cent manganese, 0.02 per cent sluphur and 0.006 per cent silicon. Analysis for gases gave the following percentages:

	Oxygen	Hydrogen
U. S. Bureau of Standards.....	0.058	0.0006
Institut für Eisenhüttenkunde....	0.059	0.0008
University of Sheffield.....	0.051	.....

The first two laboratories use a vacuum fusion method, melting in a graphite crucible in a high-frequency furnace. The American method weighs the evolved gases, while the German method measures their volume. Hydrogen reduction of a solid sample (to which is added an antimony-tin alloy) is used at Sheffield.

Planes Move Along Assembly Line

Large Use of Jigs and Fixtures Speeds Operations



*Production Schedule Calls For Regular Progression**

BY C. A. MC GRODER

ASSEMBLY in line really begins in the twelfth bay from the westerly end of the building and extends to the easterly end of the building. The first position on the line consists of three floor jigs, each 50 ft. long, in which the complete fuselage frames are assembled. The frame completed first is moved into the next position on the assembly line, where the sheeting "skin" of "Alclad" is applied. While this outer covering is being riveted to the fuselage frame other minor subassemblies are being placed in position, such as the door, the fin, the stabilizer. When the fuselage is completely covered with "Alclad" sheeting it is moved into the next position on the assembly line, where the center section of the wing is attached.

No great effort is required to move the partly completed fuselage along to the different positions on the line. All materials entering into the construction of the transport are so light that the plane is easily moved from one position to the next on two rubber-tired "dollies," placed under the ends of the fuselage when the assembly of the skeleton is completed. These suffice until the completed fuselage, bearing the center section of the wing, moves into the position next to the last on the line. Here the landing gear is added, after the wing tips are attached to the center wing section, and the plane moves into the last position on its own wheels, with their 40-in. by 10-in. special airplane tires.

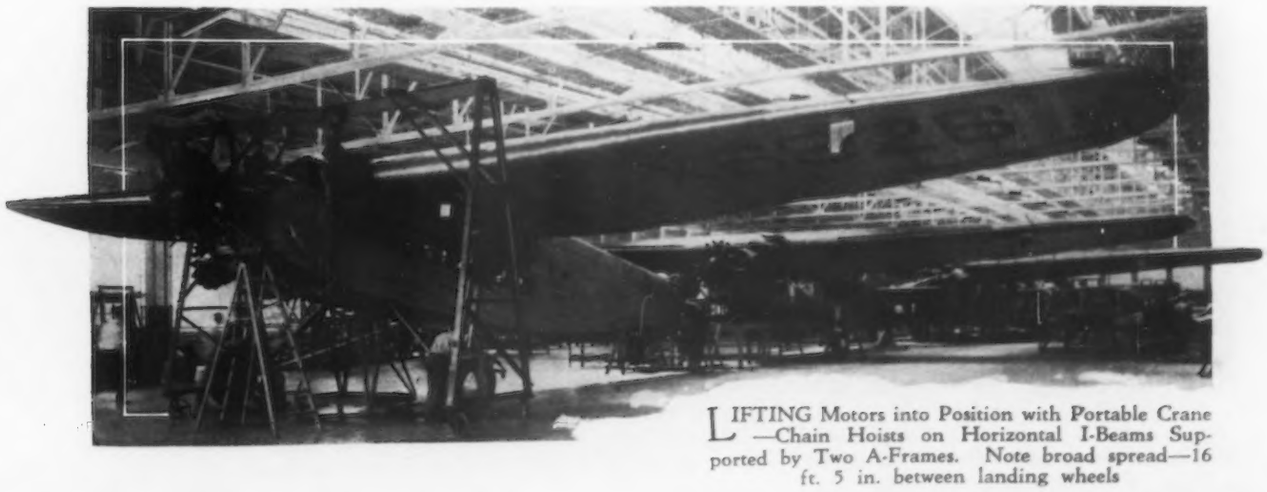
While the partly completed and growing plane moves down through the center of the building on the final assembly line, important sub-assemblies are going forward on either side. Perhaps the most interesting of these are the spar assembly and the wing assembly, conducted along the north wall of the building between the twelfth and twenty-fifth bays. Three main spars run the entire length of the wing. This is a distance of 77 ft. 10 in. in the larger plane, the model 5-AT, which is equipped with three Pratt & Whitney Wasp motors of 410 hp. each. In the smaller plane, model 4-AT, which is powered by three Wright Whirlwind motors of 300 hp. each, the wing span is 74 ft.

In addition to the main spars there are five auxiliary spars, which are of lighter construction, to save weight and because their chief function is to help hold in position (and shape) the "skin" covering of the wing and to transfer intermediate loads to the main spars. All eight spars, built of duralumin structural shapes in cantilever construction, are crossed at right angles by 14 fore-and-aft trusses, also of cantilever construction.

On both the 4-AT and 5-AT models the wing is built in three sections. On the larger, 1230-hp. model, 5-AT, the center section which is attached to the fuselage is 20 ft. long; on the smaller, 900-hp. model, 4-AT, it is 16 ft. 2 in. long. On both models the center wing section is 13 ft. 6 in. wide and, at its highest point, where the center spar is located, the wing is 31⅝ in. high.

As the difference in wing span between the two models is effected by the difference in length of their center wing spans the two outer wing sections, called the right and left wing tips, are the same size in either model. They are 28 ft. 11 in. long, 31⅝ in. high at the inside end of the largest spar and tapering down to 3 in. high at the outside end of the wing tip. Where it joins the center wing

*This is the concluding portion of an article of which the first half appeared in THE IRON AGE of Jan. 31, pages 327 to 332.



LIFTING Motors into Position with Portable Crane —Chain Hoists on Horizontal I-Beams Supported by Two A-Frames. Note broad spread—16 ft. 5 in. between landing wheels

section it is 13 ft. 6 in. wide, but it tapers in a slightly curved line to the outside end, where it is only 7 ft. 6 in. wide.

A company which manufactures steel office files advertises its product as "built like a skyscraper." A glimpse at the skeleton of a tri-motored transport wing might inspire the visitor to exclaim: "Built like a steel bridge." Cantilever construction and structural shapes employed throughout the framework of the wing convey this impression, and enable the wing to withstand the air pressure while flying at 135 miles an hour and to afford, in addition, the required factor of safety.

Spar sections are assembled in jigs after their upper and lower chords have been assembled in separate jigs. The U-shaped pieces used in spar chords are reinforced in the first assembly by having channel shapes riveted inside of them. There are nine sections of main spar in each plane, three to each wing section. In the nine sections there are six different sizes, as only the corresponding pairs in the wing tips are alike in size. So there are six different sizes of wing spar sections, each of which must be assembled in a different jig.

The center main spar section is 20 ft. long in model 5-AT and 31⅜ in. high for its entire length, as upper and lower chords run parallel. The two other center spar sections are also 20 ft. long and their upper and lower chords are equidistant, but they are not so high as the center main spar section, for their height is limited by the tapering fore-and-aft lines of the wing. All six of the wing tip main spar sections are highest where they adjoin the center spar sections, and taper to about 3 in. in height at the extreme outer end of the wing tip.

Completed sections of wing spars are knitted together when the fore-and-aft trusses are fabricated into the skeleton of the wing section. When this is accomplished the "skin" covering is applied and the wing tips are ready to be attached to the center wing section, which is the first to become part of the plane. Wing tips are attached to the center wing section by means of 24 forged steel fittings, which are riveted to the upper and lower chords of main spars at exposed ends of wing sections. Each pair of these fittings, when bolted together with a steel bolt, forms a fixture which joins the upper (or lower) chord of a wing tip spar to the corresponding chord of the center wing section spar. There are 12 of these fixtures, six at either end of the center wing section.

Welded Tubular Motor Mounts Used

When the center wing section and later the wing tips are made a part of the transport that is nearing completion, it is ready to move into the final position on the assembly line and to receive its motors. These are affixed to the plane by means of motor mounts built of various sizes of chrome-molybdenum tubing welded together. The center motor mount is a triangulated perpendicular frame, square on one side and circular on the other. The square side is backed against the foremost bulkhead in the nose of the fuselage, where it is attached with steel fittings. The motor is then bolted to the circular side of the frame, which runs parallel to the square base.

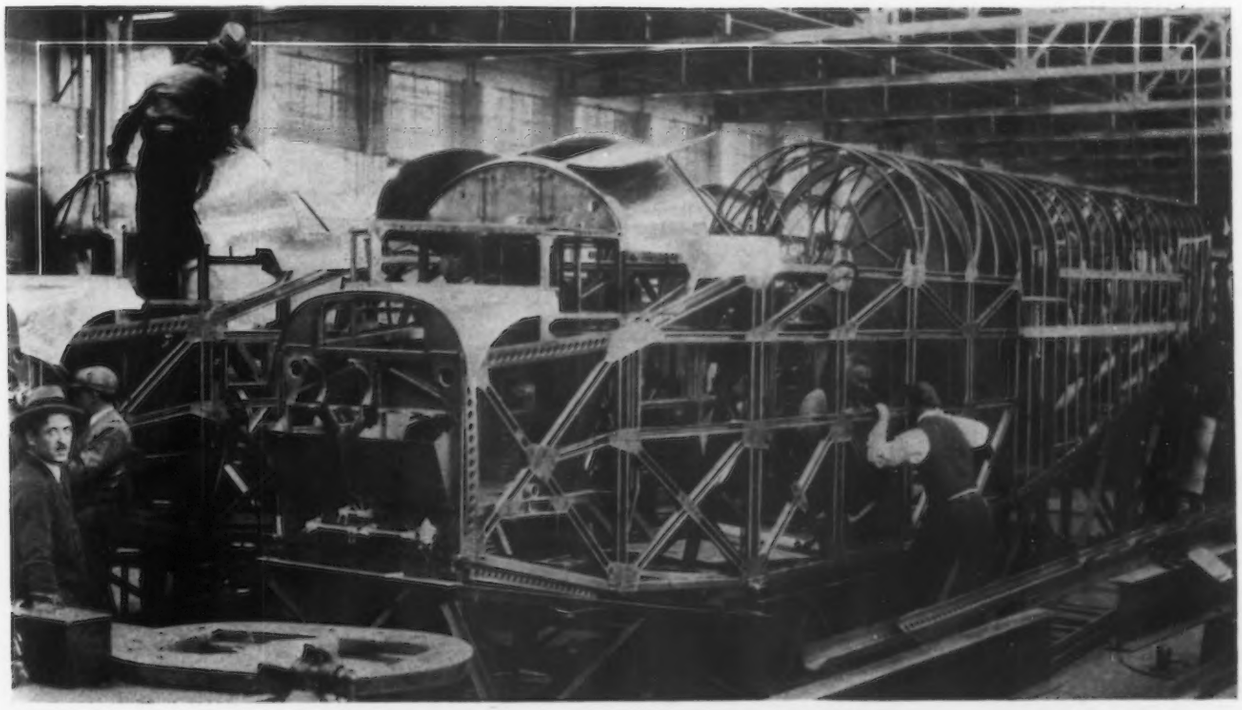
The two outboard motors, suspended from the under side of the wing on either side of the fuselage, are held in place by more complicated motor mounts. The upper sections of the outboard mount are affixed to the outer ends of two of the center section main spars by forged steel fittings, which are riveted to the uprights of the spars. Instead of suspending the outboard motor midway between these fittings, the outboard mount is so constructed that it projects the motor forward, so that it is ahead of the leading edge of the wing. This adds much to the propeller efficiency of the outboard motors, as it enables them to function in comparatively free air. The open construction of the outboard motor mount more than compensates for its weight, by allowing a freer flow of air from the propellers while offering little parasite resistance to the forward motion of the plane.

While in this final position on the assembly line a variety of detail work is done upon the plane. Exhaust

SOME of the Forged Steel Fittings Used in the Ford Tri-Motored Transport. Back row, standing, Nos. 1 and 3 are hinge fittings which attach wing tips to center sections. Each plane has 12 of each of these. They are horizontal, securely riveted to upper and lower chords of the three main spars where the wing tip sections adjoin the center section. Between is axle for a wheel in the landing gear. At right is a forged fitting from which outboard motor mounts are suspended. Four of these are used in each plane. In position the small jaws which hold the motor mount protrude downward through the "skin" on the under side of wing; the longer jaws are riveted to heavy uprights of main spars at outer ends of center section of wing

MOTOR Mount for Outboard Motor, Made Entirely of Chrome-Molybdenum Tubing Welded Together. Tubing varies from ⅞ in. diameter with 0.035-in. wall to 2 in. diameter with 0.095-in. wall. Mount is suspended from under side of wing by forged steel eyes shown at top of suspension angles. These eyes enter the jaws of forged fittings riveted to main spars of the wing, and are secured with steel bolts. Motor is attached to vertical welded circle, at right

DUE to the Taper in Both Plan and Front Elevation of the Wing Assembly, the Nose Also Tapers in These Planes. A strake of corrugated skin is passed through tapered rolls a number of times to obtain the required shape. Each section is "gaged" in a frame in its proper position, until the entire width of the wing along the leading edge is completed. Fabrication of these sections "works" the metal severely, increasing its compression stiffness



COMPLETING Assembly of Fuselage Frame. Large duralumin structural shapes and gusset plates form framework of forward section, in which are cabin and cockpit. After section is of lighter duralumin shapes, to save weight. Entire fuselage has same 0.010-in. skin thickness as wings

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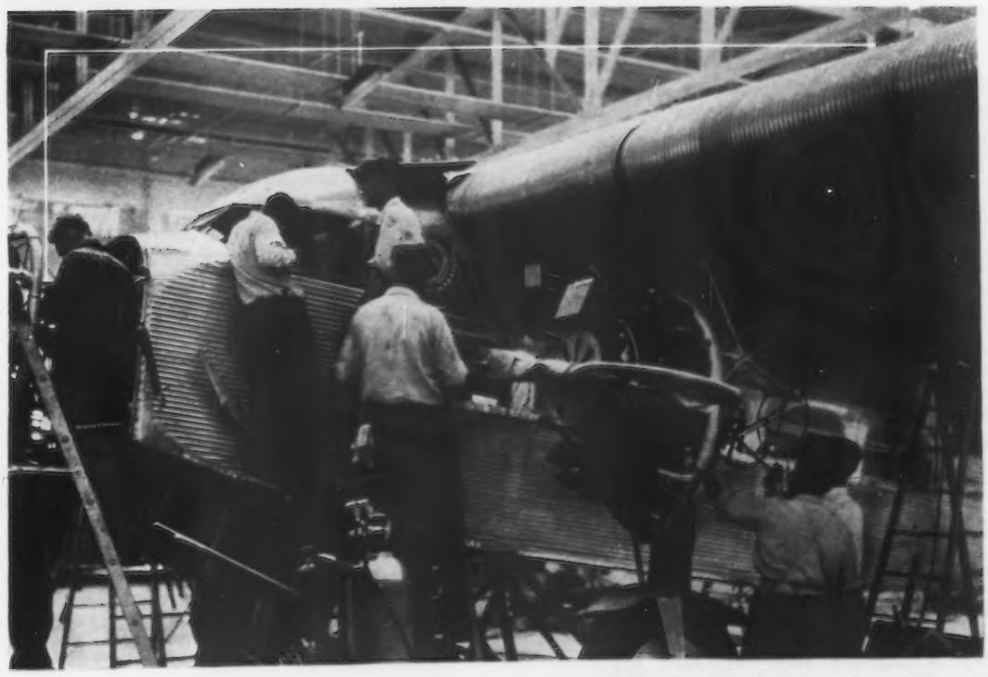
Assembly Work on Plane Nearing Completion. Cowling rings are being welded, magnetos tested, gas and oil lines connected to center motor and pilots' cabin inclosed with nonshatter glass. Slot opening in wing shows where tip section is bolted to center section



tubing, which has been assembled on the south side of the building, opposite spar and wing sub-assemblies, are put in position on the motors. Other sub-assemblies which are conducted on this side of the final assembly line are here added to the plane. Control parts, such as ailerons, rudder, elevators, are added to the plane and connected up with the control cables. All of these cables, which are 5/32-in. galvanized flexible steel cable, run on the outside of fuselage and wings, readily accessible for inspection and repair, but the ball bearing sheaves over which they run are located just inside the "skin" covering. In this position the pilots' cabin is inclosed in non-shatter glass, magnetos are tested and gas and oil lines are connected to the motors.

Two Pilots Exercise Dual Control

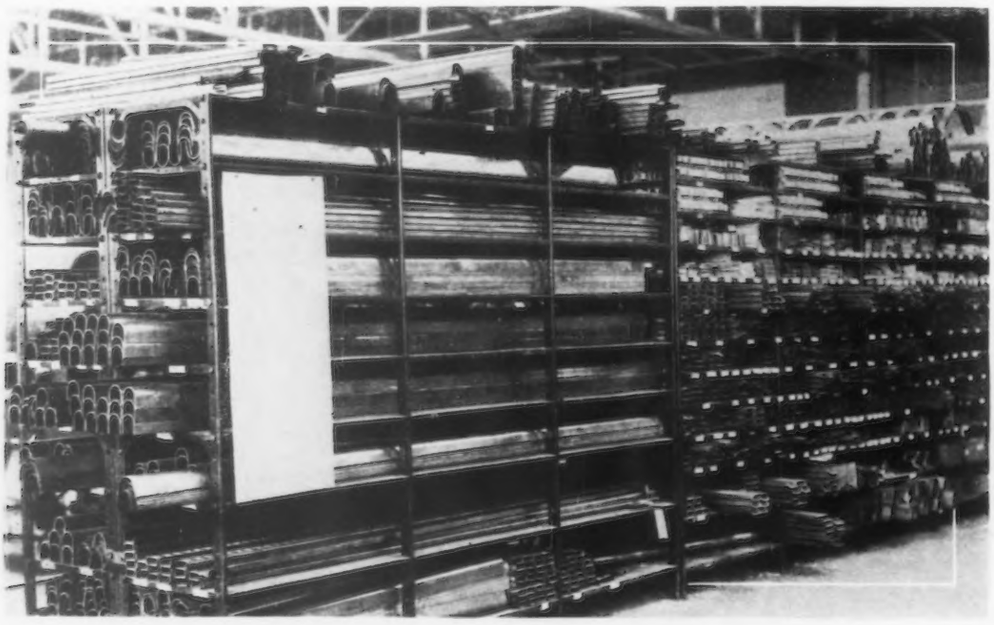
The Ford tri-motored transport, first all-metal airplane to be built in the United States, is dual control, so that either of two pilots sitting side by side in the cockpit may have entire charge of the plane at any time. Directly in front of the pilots is the instrument panel, every instrument in plain sight of both pilots. Every Ford transport is equipped with the following instruments: compass, altimeter, turn and bank indicator, clock and, for each motor, one oil pressure gage, one oil temperature gage and one tachometer. When these are in place the plane is complete except for the interior furnishings in the cabin.

Interior furnishings, always supplied to order, are not included in the list price of the plane. Wicker chairs, the lightest comfortable seats obtainable, are the prevailing choice, but any desired variety of furnishings will be supplied on order and the cost added to the list price of the plane. In the case of the model 5-AT, which develops 1230 hp. with its three Wasp motors and has a cruising speed of 115 miles an hour, the price is $65,000. This model is built to carry 14 passengers and two pilots, has a wing area of 835 sq. ft., and can carry a maximum of 355 gal. of gasoline in its tanks, which are located in the wings.

Exceptional Stability Provided

An examination of the structural characteristics of the Ford tri-motored transport discloses that the engineers who designed it recognized safety as the most important factor in the development of commercial aviation. The transport is of the long-tailed type, its total length being 49 ft. 10 in. in either model. The large stabilizer, elevators and counterbalanced rudder, located at the very tail end of the fuselage, at such a great distance from the wing, contribute largely to the inherent flying stability of the plane. This stability is enhanced by the location of the tapered, high-lift wing above the fuselage, for this places the center of lift above, rather than level with or below, the center of weight.

These features make it possible for the plane, once in the air and directed on its course, to "fly itself." This is more than a mere colloquialism in the industry. It means that the transport requires but a minimum of effort on the part of the pilots to hold its course and to continue to fly on what a sailor would call "an even keel." Once on its course, the controls properly adjusted, the transport will carry on and all that will be asked of the pilots is that eternal vigilance which is the price of absolute safety.



ONE of Many Stock Racks on Both Sides of Final Assembly Line. This view gives some idea of the numerous structural shapes into which duralumin sheets are formed before they enter construction of fuselage skeleton and the spars and trusses in the wings

British Eliminate Bessemer Process in Rail Specification

A revised edition of the British Engineering Standards Association's standard specification for bull head railroad rails has recently been issued to supersede the 1922 revision. In it all references to steel made by the basic Bessemer and other processes have been eliminated; the maximum limits of sulphur and phosphorus in steel made by the open-hearth process (ordinary and higher carbon qualities) and of phosphorus in steel made by the basic Bessemer process (higher carbon quality) have been raised; and the obligation to mark rails with the association's brand (or mark) has been canceled, as a new mark has been registered which may be applied only to rails manufactured in Great Britain and in accordance with the complete requirements of the British standard specification.

Stability of metals at elevated temperatures is the subject of a 122-page pamphlet (Bulletin 11) issued by Department of Engineering Research, University of Michigan, Ann Arbor. It contains a fuller account of the researches described by Prof. A. E. White before the December meeting of the American Society of Mechanical Engineers, and summarized in THE IRON AGE, Dec. 20, 1928.

Wanted: Better Chromium Plate

"When Articles with Flash Plates of Chromium Are Sold with the Understanding That They Will Not Stain or Wear Off, the Consumer Is Buncoed. Unless Coatings of Real Merit Are Produced, There Will Be a Decided Reaction Against Chromium Plate."

BY JAMES C. PATTEN*

IN view of the misstatements passing about, it may be emphasized at the outset that there is little difference in the chemical composition of solutions offered for commercial chromium plating by companies licensed under the principal patents. All chromium plating solutions are low in efficiency in comparison with those for copper, zinc, nickel, silver and cadmium. While they are more nearly foolproof and require less attention, they must be made under chemical control.

The stability attained by good chromium plating solutions, the physical properties of the metallic plate, the low cost per square foot of coverage, and the short plating time necessary for protective coatings, offset to a certain extent the low efficiency of the plating bath and make the solutions now available profitable in manufacturing plants working on a production basis. Experience is of more value in chromium plating than in applying other metallic coatings. Carelessness and incompetence on the part of the plater always result in expensive losses; articles must be properly cleaned and racked, the bath must be the right temperature, and the current density must be kept in adjustment at all times.

Finishing Department Is Usually "Nobody's Child"

Three major tasks confront those intending to plate their products with chromium:

1. Modernization of the electroplating department so that its mechanical efficiency is put on the same plane as that of other departments.
2. Adoption and application of definite electrolytic coatings of proved merit.
3. Creation of a new chromium bath which not only has a high degree of efficiency, but also is capable of being maintained by non-technical operators.

A description of oft-observed unsatisfactory situations should convince the reader that the accomplishment of these tasks is imperative, if chromium plating is to be permanently established on a sound basis.

I have not yet seen a manufacturing plant wherein the metal finishing department is as efficient as the fabricating departments. The reason probably is that business executives, managers and superintendents are or have been either mechanical engineers or skilled mechanics. It is the nature of man to do the things he knows and likes; consequently in the iron, steel and metal-working industries the machine is favored and the chemist or metallurgist plays a comparatively minor part. In the chemical industries, on the other hand, the chemist has just as much difficulty in seeing the need for rearranging a group of presses, say, in order to speed up production, as has the manager of a brass mill in appreciating the requirements of the plating department. How many manufacturing executives realize, for instance, that the loss from damage to a truck of polished parts which has been allowed to stand overnight in a moist atmosphere is greater in dollars and cents than the cost of almost any operation in the fabrication department?

Customers are demanding permanent finishes, and this in turn is bringing about a radical change in general manufacturing methods. Duco, vitreous enamels and chromium now produce a finish the quality of which was never before known. Furthermore, the manufacturer is able to use colors and finishes of real merit and durability.

Enameling, painting and all other forms of finishing until a short time ago were of minor importance to the engineer, chemist and industrial executive. Finishing departments were operated by men whose knowledge usually was handed down from father to son; in fact, these men were free lances so far as their activities were concerned. However, the new finishes have brought about a radical change in personnel and methods. The chemist has worked out new processes of plating and the engineer has designed efficient handling devices. Both are beginning to appreciate the fact that the production schedule in all departments must be so laid out and synchronized that the line in the metal finishing department is just as straight and as free from breaks and reversals in direction as in the other departments.

Chromium plating can be done so much more rapidly than other forms of finishing that the handling of work is one of the outstanding problems to be considered in the installation. By "handling" I mean not only a steady flow of work through the department, but also adequate provision during inspection, for polishing and for cleaning. Then and then only can the department function properly and keep losses down to the minimum.

Speed Invites Coatings Too Thin for Durability

Demand for chromium-plated articles has developed so rapidly that almost every progressive metal manufacturing company is trying to make this finish, yet few know even the most elementary principles of the art. Automobile manufacturers, for instance, specify chromium finishes and buy them the same as they buy nails. They have no standard specification for the simple reason that they do not know what to specify in order to get a part which will resist the wear or corrosive action to which it will be subjected in service. In many cases only experience of several years will return the answer.

When chromium-plated articles are sold to the consumer on the strength of the statement that "they will not stain, tarnish, corrode or wear off," the consumer is being "buncoed." Many of these articles are in bad shape even before the buyer gets them. Unless there is a change in buying and selling tactics, and coatings of real merit are insisted upon, there will be a decided reaction against chromium finished articles.

The majority of chromium-plated articles now on the market would show signs of rust in less than 15 hr. exposure to the Bureau of Standards' salt spray test. Several such articles tested by the writer were made of iron or steel, plated first with copper, then nickel, and finally flashed with chromium. While such a test is unfair to a

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real chromium plate, it nevertheless affords a comparison of value of the parts now being marketed.

To protect automobile body stock from atmospheric corrosion, a minimum thickness of 0.0005-in. of chromium is necessary. To apply this coating requires 30 min., in a cold solution, but if the plating is done with a hot solution, such as is generally used, the time will be 1 hr. 10 min. A recent investigation made in five automobile accessory plants showed no case where the combined thickness of the copper and nickel undercoatings exceeded 0.0005 in., and the chromium-plating time varied from 10 seconds to 1 min., which would give a maximum thickness of 0.00001 in. Such flash coatings are valueless, and invite trouble.

A fair grade of steel, well polished, with an undercoating of 0.002 in. of copper and nickel, upon which 0.0001 in. of chromium has been applied, will withstand 70 hr. exposure to salt spray. Such a finish costs money. To the best of my knowledge, the only inexpensive coating of real merit for iron and steel is one of chromium over cadmium. An undercoating of 0.0002 in. of cadmium, over which is put a 10-min. deposit of chromium, will withstand at least 250 hr. in salt spray. When applied to automobile body stock it will resist corrosive salt spray for at least 500 hr.

The secret of good chromium plating is the proper cleaning of the surface to be plated, the proper selection and application of the "filler" or undercoating, and the knowledge of the proper type and thickness of chromium to be applied. The coating used to resist corrosion and wear on a radiator shell, for instance, is not the same as the finish that should be applied to a brass headlamp. Furthermore, a brass headlamp should receive different treatment from that for steel. These finishes in turn are unlike the successful coatings applied to crank or cam shafts, while a pump shaft requires a chromium plate entirely different from any of the above.

In my opinion, no chromium-plated commodity should be marketed until definite and intelligent tests have been made, and these tests cannot be completed and standards determined in less than a year. Some manufacturers of stamped and spun brass parts fully appreciate this caution, for they learned to their sorrow that chromium looks splendid when first applied direct to their product, but after a few months the beautiful finish comes off. Some other chromium-plated metals act the same way, so that it is necessary to refrain from recommending chromium until the coating has definitely proved its value.

Much Research Continues

Nothing specific can be said at the present time regarding improvements in plating solutions, except that any change to be of value will be radical in nature. Many chemists are working on this problem; discoveries from this concentrated effort may come tomorrow or after several years. However, it is safe to say that eventual improvement will not be toward a solution of greatly improved efficiency, because the operative costs with the present solution compare favorably with nickel plating. Also, the probabilities are that, even if a new and more efficient solution is discovered, it can be utilized with the same electrical equipment that is now being installed. Chromium solutions now require about 100 amp. per sq. ft., so that present plants would probably have a generator capacity which could do four or five times more plating than present requirements demand.

Forging a 165-Ton Ingot Into a Boiler Drum

VARIOUS stages during forging 55-ton drums for several high pressure boilers made by Vickers-Armstrongs Limited, Sheffield, are shown in an illustrated supplement to *Engineering*, Nov. 30, 1928. These drums are 44 ft. long, 5 ft. 3 in. outside diameter, and wall thickness 4½ in., and are designed for 800 lb. operating pressure. Three proof tests are imposed on each finished drum of 1600 lb. per sq. in., maintained 60 min. each time. Test pieces taken from the end of the completed forging must stand a proof load of 24,600 lb. per sq. in. without permanent set, a yield point of more than 29,000 lb. per sq. in., and tensile strength between 58,000 and 70,000 lb. per sq. in. Minimum elongation is to be 25 per cent on 3 in. and 45 per cent reduction in area. One-inch bars must bend to a closed U around a ¾-in. bar.

The ingot for such a drum weighs 165 tons; it is a fluted octagon, 87 in. over flats, 10 ft. high, with a conical sink head 7 ft. high. It is poured from four acid open-hearth heats, so adjusted in chemical composition as to minimize the expected segregation, bottom to top. The mold is set on a turn-table and turned four times a minute during casting. It is stripped after 24 hours and transferred to a cooling pit, remaining there at least one month.

Discard is cut from both top and bottom in a special lathe, wherein the cutting tools rotate around the stationary ingot; a 24-in. central hole is then put through the axis with a trepanning tool. Chemical analyses near this hole and near the outside show remarkable constancy:

	Bottom Center	Bottom Surface	Top Center	Top Surface
Carbon	0.21	0.26	0.30	0.25
Manganese	0.55	0.60	0.55	0.54
Silicon	0.24	0.26	0.24	0.23
Phosphorus	0.028	0.031	0.030	0.034
Sulphur	0.022	0.022	0.030	0.030

Rough forging is done under an 8000-ton press; finish forging under a 4000-ton press. Excellent photographs show that this operation was done in several steps:

(a) Expand the 2-ft. center hole and bring in the corners of the ingot, thus making a rough tube about 4 ft. internal and about 7 ft. outside diameter.

(b) Forge the central portion over a 4-ft. mandrel to a wall thickness of about 12 in. In this form it looks like a huge spool.

(c) Bring down each end in succession to the same wall thickness.

(d) Again starting at the center, forge a portion of the wall to thickness as close to rough dimension as convenient in the large press.

(e) Work toward either end in alternate steps.

(f) Finish under 4000 ton press. Ends are left thicker for closing in.

(g) Normalize.

(h) Cut to correct length, finish both inside and outside.

(i) Close in both ends.

(j) Machine ends, inside and outside.

(k) Give proof tests.

(l) Drill for boiler tubes.

Silver solders, usually regarded as materials for jewelry and table-ware manufacture, are being adopted for specialized purposes in aircraft production and other industries. Information gathered at the Chicago Aeronautical Exposition indicated that leading manufacturers of commercial planes are following the United States Army specification, calling for silver soldering all joints in the copper tubing used for oil or gas lines. Push rods and motor attachments subjected to excessive vibration are frequently joined with silver solder. It is used as a brazing material under the oxy-actylene flame.

Tests On Full-Sized Pipe Joints

Good Penetration and Proper Reinforcement in Plain Butt Weld Will Develop Full Strength of 16-In. Pipe Wall

TESTS on oxwelded joints in full-sized pipe have been made at the McKeesport laboratory of National Tube Co., during a joint investigation with Linde Air Products Co. The results are summarized in Serial Report No. 1, from the sub-committee on pipe joints, American Gas Association.

Both low-carbon lap welded pipe and seamless steel pipe (carbon 0.30 to 0.40 per cent) were used in sizes from 4 to 16 in. diameter. Four styles of joints were tested, viz: the butt weld commonly used for oil transport lines, and three variations of the socket joint which have been specified on power house work. Sketches and dimensions are shown in Figs. 1 to 4. Six or more joints were tested in each size and style.

To make a single test a 20-ft. standard piece was cut into three 6-ft. lengths; the stub was reserved for chemical and microscopic analysis; two of the pieces were made into the joint, and the third tested to determine the strength of the original pipe. Welding rod used was a mild steel containing enough silicon and manganese to be self-fluxing.

All joints in 4 and 8-in. pipe developed 100 per cent efficiency when pulled in tension, that is to say, fracture with only one exception occurred some distance from the joint and at an average load equal to the strength of the unwelded portions tested for comparison. In the 12-in. pipe about one in six failed at the joint; in the 16-in. pipe from one-half to all of them failed in this manner. The table summarizes the results:

Tensile Tests on Full-Sized Pipe With Oxwelded Joints

	Pipes Tested	Failures at Joint	Average Strength, Lb. per Sq. In.	Average Efficiency, Per Cent
12-In. Lap Welded Pipe				
Butt weld (Fig. 1)	6	1	54,830	99.0
Normal socket (Fig. 2)	6	1	49,500	93.3
Socket with groove (Fig. 3)	6	2	51,400	96.0
Socket with rivets (Fig. 4)	6	1	47,500	97.3
16-In. Lap Welded Pipe				
Butt weld (Fig. 1)	12	7	52,020	95.0
Normal socket (Fig. 2)	6	4	50,600	92.3
Socket with groove (Fig. 3)	6	5	46,000	84.5
Socket with rivets (Fig. 4)	6	6	44,600	83.0

It is therefore evident that the simple butt weld is

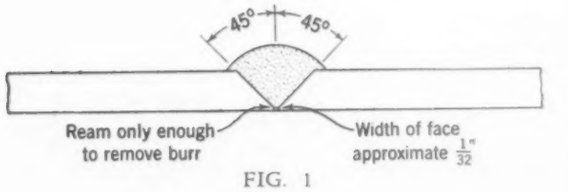


FIG. 1

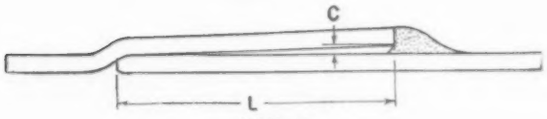


FIG. 2

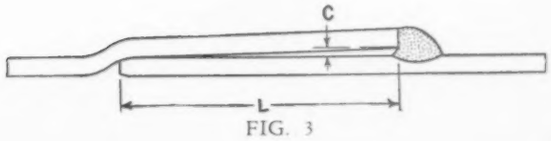
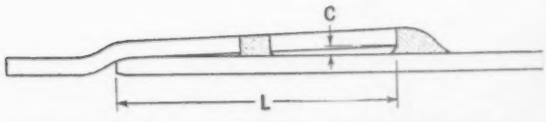


FIG. 3



Size	Depth of Socket L	Space Between Tube and Socket C	Diameter of Holes for Welding Plugs	Number of Holes for Welding Plugs
4" O. D.	3 15/16"	3/64"	5/8"	2
8" O. D.	3 15/16"	1/16"	5/8"	3
12" O. D.	3 15/16"	3/32"	7/8"	4
16" O. D.	3 15/16"	3/32"	7/8"	6

FIG. 4

Fig. 1 to 4—Dimensions of Oxy-Acetylene Welds Tested in Pipe

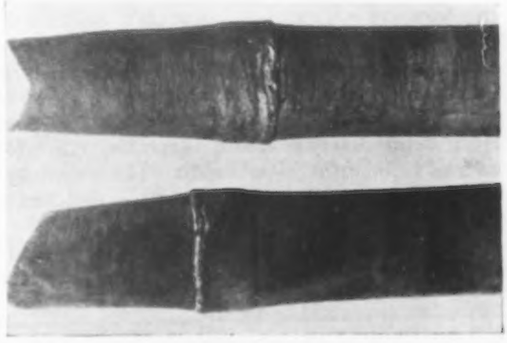


Fig. 5—Typical Appearance of Socket Joint in 8-in. Pipe After Failure in Tension

Fig. 6—Socket Joint in 16-in. Pipe and Butt Joint in 8-in. Pipe After Testing in Compression

the strongest, and as it is the cheapest it should be preferred.

During the above described tests it was observed that the fracture generally occurred in the 12-in. pipe half way between joint and grip. (Fig. 3.) Furthermore, it was apparent that the reinforcement at the joint on the larger pipe was hardly sufficient. A new series of six oxy-acetylene butt joints was, therefore, made in the 16-in. pipe, using the same welding rod and operator, but paying especial attention to welding through to the bottom of the joint and building up a smooth reinforcement at least one-third the thickness of the pipe wall. These joints were made off center, to place them at the position where the others were observed to fail. However, all these joints developed full strength of the pipe, and failure occurred some distance from the weld. Compressive tests on 8 and 16-in. normal socket joints resulted as shown in Fig. 6. After compression to half the original length all welds were found undamaged.

In addition to the details of the tests for strength, the report also gives cost data and procedure control for making oxy-acetylene welds in steel pipe.

Steel Railroad Ties Used in England and United States

AFTER about eight years' experience with a sample lot of steel ties, the Southern Railway in England has ordered 70,000 ties for main line traffic from the design of C. P. Sandberg. The first cost is reported to be no higher than that of a first-quality wooden tie from Canada or Norway, creosoted and equipped with chairs. This is the third large order for metal ties in the history of British railroads, according to *Engineer*, Dec. 14, 1928. Between 1880 and 1890 about 100,000 were put into the track of the London and North-Western Railway; many of them are still in use after 40 years' continuous service, but these ties have open ends and do not keep alinement properly. Another style was used in quantity in 1887 by the North-Eastern Railway, but was not satisfactory under heavy and fast traffic. Corrosion on these roads was not a factor in the failure, except where ashes was used as ballast.

The new order for the Sandberg tie, which is a ribbed bar with edges and ends turned down, is hailed by British steel makers as the entrance of steel into a new and important market. The steel ties used widely in India, South Africa, Germany and Mexico are adapted to the flat-bottomed rail, such as used in the United States. The Sandberg design is the first wherein the necessary chair for a bull-head rail is integral with the tie. The simplicity of the fastening is obvious; one tie, two tie plates, and two wooden wedges are all that is needed.

Electrical circuits in track are not widely used in England. The Southern Railway plans to retain wooden ties in such sections as are necessary—perhaps 10 per cent of the line.

American engineers show little or no interest in steel ties, except for special localities like ash dumping tracks or industrial trackage to handle molten metal or slag. An exception to this is the utilization of discarded rail for ties. Two pieces cut to proper length are placed a few inches apart, and joined at the ends by welding on a scrap angle bar. Standard tie plates are then welded across the tops in the proper position. The running rail is attached by bolts and clips, or by clamps and spring keys as shown in Fig. 2. Special clamps permit the use of rails of different sections on the standard tie plate. It is said that the cost of this tie less its scrap value is about $1, or less than a creosoted wooden tie. About 1500 of them are manufactured monthly by the Delaware & Hudson Railroad by the machine illustrated in THE IRON AGE, July 19, 1928, and laid in second track.

Manufacturers of accurate chronometers have practically standardized on invar, the iron-nickel alloy with smallest coefficient of expansion, for balance wheels and hair springs. Arthur D. Little's *Industrial Bulletin* suggests that this improvement will be adopted for watches, since a plain, screwless balance rim is much easier to manufacture or repair, and much sturdier than the bimetallic balance wheel.

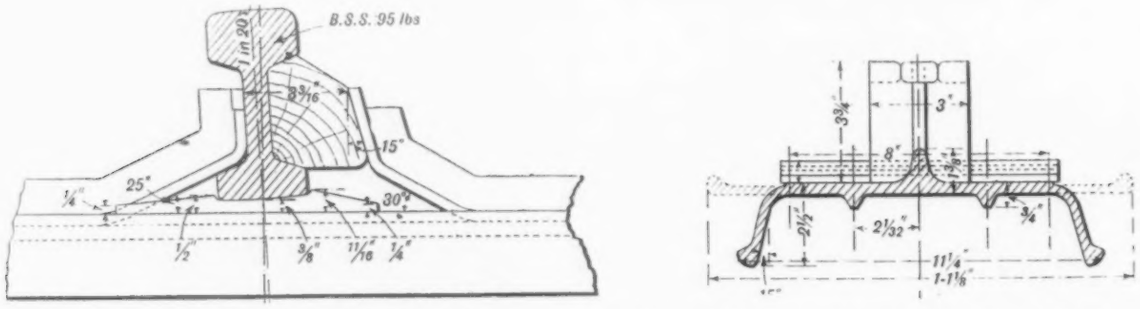


Fig. 1. Cross Section of Sandberg Steel Tie and Sketch Showing Method of Attaching Bull-Head Rail

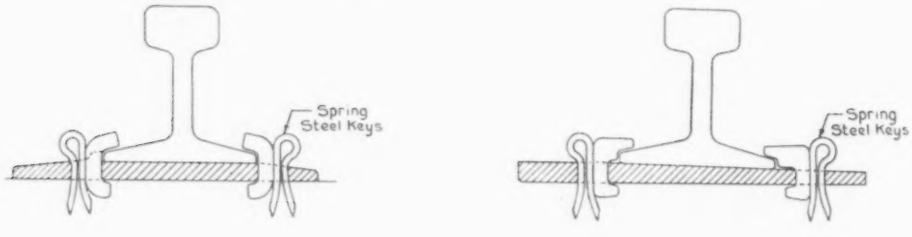


Fig. 2—Method of Attaching Standard and Undersized Rails to Welded Tie

Leaves from the Diary of a Foundry Apprentice

BY H. A. FROMMELT*

March 2.—Another trip with Mr. Haney; this time into the by-ways of the business, those out-of-the-way places we seldom hear of and very seldom see, such as the research department, where experiments are going on continuously with new equipment, new methods and new products. Here is a place where money is being spent with little or no chance of getting it back immediately. A hundred thousand dollars a year is the annual budget for this purpose. And at one time the company designed and built some new equipment and, after testing it, decided it was not marketable. Result, one million dollars spent with nothing to account for it. Still I suppose that is necessary to keep ahead of the other fellow or lose your business. This was surely a revelation to me.

I like their methods around here more and more. Mr. Haney never lectures on this stuff as though he were trying to sell something and had a hard job doing it. In fact, he does no lecturing at all; he just hauls out the figures, lets you examine them for yourself and draw your own conclusions. That is the strongest kind of argument, at least for me.

March 5.—Into the inspection department for a few days as a filler-in while one of the regulars is nursing a case of "flu." I've seen more of the foundry in this one day than I did in the previous year. It's like getting an airplane view of the whole countryside with one squint. It's interesting even though I am only chasing castings; I'm on what is called the "detective squad," corralling the bad ones and then getting somebody indicted for the dirty work. This is all good exercise for my diplomacy and sweet disposition. If I have any friends left after this snooping around it will be because I polished up my sweet disposition.

March 10.—That was a strenuous five days I put in with the detective squad. I've worn out one pair of shoes and a perfectly good set of vocal organs trying to convince these birds that these castings were bad and at the same time keep their fur smooth and lying in the same direction. Jack believes that half the game is getting on with the people, those you work with and those you work for; if you can do this you are fit to have people work for you.

March 11.—I've got to get busy on this annealing stuff; while in the inspection I had a chance to measure my ignorance. "Single anneal," "double anneal," "normalize," etc.—what's it all about? And another thing, this cleaning department—"cutting," "tumbling," "sand blasting," "welding," "chipping." I want to know something about those operations and how those fellows work down there.

March 15.—"Acid" and "basic"—I've had something of that in the lectures on the "Making of Iron and Steel," but now to see it first hand. I should have some scouting agents out ahead of me getting all the information I need and crave.

March 16.—I don't seem to be getting on with this foreman as I should. Maybe it's only imagination.

March 17.—Saw an excellent example today of heads and risers on a large gear blank. The raw casting weighs 80 tons; when machine-finished it will weigh less than 60. The most of this is in scrap heads and risers. That must cost the company something; first to melt all that extra metal, then to cut off these heads and risers with acetylene torches and then to break them up to be remelted. Surely the company gets paid only for the finished weight? I must find out about that.

March 18.—I'm sure now there is something wrong between this foreman and myself. Every time I run into him I can feel my back humping up like a cat meeting a dog; something is wrong!

March 20.—The lecture on modern foundry practice was like taking a cold plunge after a heavy sleep. It's funny how many things one can look at without really seeing them. Of course, a foundry would have to be laid out so that the handling of materials was a minimum. Think of it! Eight tons handled for every ton of castings produced. And some poorly laid out foundries handle as much as 35 and 40 tons.

March 22.—Had a talk with Jack about this foreman and I told him my troubles. "He's just a bit peculiar—you have to study him and find out how to approach him. That is the biggest part of this game—getting on with people," according to Jack. Now to study that foreman. I'll try something new on him tomorrow.

March 23.—It seems to work; the first thing bright and early I put on my best front and a big smile; I told Brankard that when he had a little time I would like to get some information from him. As soon as he finished with the planning committee meeting he came over. I had some important questions to ask him about the work in this department, as well as some general questions about the foundry business—some of these things that have been bothering me for some time. He certainly did his level best. Before going he told me that he expected every apprentice to regard him as a teacher as well as a foreman. And he wanted us to ask questions; sensible ones, of course, and to use our judgment in picking the right time to use him as an encyclopedia. "I am also responsible for the production on this floor, but there are always times during the day when a foreman can help an apprentice." That's my cue from now on.

March 25.—Had an excellent opportunity to see the construction of an open-hearth furnace; Mr. Brankard took me over to the one that is being rebuilt. There I saw the floor, roof, checkers and the whole works. And this little reliance on Brankard did its stuff too. We are getting on like pals now.

March 27.—Annealing does the trick of making these castings just what the customer wants. Heat twists the little crystals of steel around so that they hook together better and give more strength.

March 30.—Brankard piloted me to the annealers for a half hour today; pointed out their construction and emphasized the necessity of placing the oil burners in such way that the heating will be uniform throughout the oven.

April 2.—Single anneal for our castings—0.25 per cent carbon, 1550 deg. Fahr. I've embalmed that one for good.

April 4.—Only a few weeks and I shall be given a transfer out of this department. Where the time has gone I don't know, much less what I should have learned.

April 5.—The foreman handed me a customer's blue print and asked me to figure out how I would mold that one. It was a fine way to find out what I knew about reading drawings. Which reminds me that I need to throw this sketching stuff in high. Brankard explained where I was wrong in my recommendations for that particular

job, though I was partly right. Then he explained how differently it would have to be done if the order called for a large number of castings from the same pattern. "Setting them up on plates and throwing them on to a machine," all of which he explained I would know more about when I reached the machine molding department.

April 7.—Wood and iron flasks; of course I've seen both of them around here, but never questioned the why of them. Before I woke up Brankard asked me why we didn't use wood flasks for the dry sand molds in this department. I stuttered like a stammerer in an earthquake and before I made a fool of myself he took me over to the drying oven. "Do you see any reason now why iron flasks should be used?" Just then I saw a truck load going into the nice red hot oven. My face got as hot as these molds and I know if it had been wood it would have looked like charcoal at least. Wood flasks—hot ovens; I didn't say a word and Brankard knew I knew.

April 9.—Double anneal: Heat up to 1550 deg.; cool either quickly or slowly and then reheat to about 1220 deg. Another bit of information tucked away for keeps. But I must find out why different temperatures are used with different percentages of carbon.

April 10.—Plans for the big semi-annual dinner are under way. The company gathers all apprentices together for this affair, and diplomas are given to all those who have graduated during the past six months. This one has been delayed a bit as the president has been away on business. They are never held unless he can be present. Jack will receive his diploma along with about six others.

Glycerine Advocated as Advantageous in Quenching Solutions for Steel

GLYCERINE as a medium for quenching steels was discussed by F. W. Darke and E. Lewis in a paper entitled "Glycerine in Steel Quenching," delivered at a joint meeting late last year of the Bristol section and the Chemical Engineering group of the Society of Chemical Industry, held at Bristol, England.

According to the London *Iron and Coal Trades Review*, the authors say that it is common practice to use water heated to about 80 deg. C. as an intermediate quenching agent, but that in their opinion this method is unreliable, owing to the fact that the cooling rate rapidly changes with small variations in the water temperature, especially when the boiling point is approached. Considerable advantages would ensue, the authors suggest, by establishing suitable intermediate quenching agents, resulting in many refinements in the technique of the hardening of steel. Emulsions of oil and water have been proposed, but the presence of even traces of emulsifying agents has been found to be detrimental and in the absence of this agent the oil-water emulsions are often unstable.

Results of experiments carried out by the American Society for Steel Treating have shown, say the authors, that almost any desired range of cooling rate between those of oil and water can be attained by the use of glycerine-water solutions of various concentrations. The cooling rate of steel decreases continuously with the addition of glycerine to water, and more rapidly as the percentage of glycerine is increased, pure glycerine being slightly below oil; hence glycerine and water solutions effectively bridge the gap between oil and water. At lower temperatures glycerine-water solutions give a much more rapid cooling rate than oil. Hence the possibility of choosing a glycerine-water solution, which will harden no deeper than oil and yet cool through the lower temperature range more rapidly.

Shooting Dowel Pins Into Steel Plate

Much interest was exhibited by production men of the Society of Automotive Engineers at the Detroit meeting, Jan. 18, in an account of the Temple high-velocity penetration devices, given by F. E. Shepard, vice-president Robert Temple, Inc., 410 Equitable Building, Denver.

The device demonstrated resembled a pneumatic hammer with an oversized barrel. It is really a gun (which drives ½-in. conical shaped pins into steel plates ½ to 1¼ in. thick) equipped with recoil and noise absorbing devices. A cartridge contains the necessary amount of propellant—about half a teaspoonful of commercial gun powder for shooting a ½-in. pin into ¾-in. plate.

Since the device will pin together adjoining pieces of steel without the necessity of previously punching or drilling holes, it is being developed for erecting members prior to welding joints in buildings, bridges, or tanks, for attaching patches to ship's hulls or sub-aqueous piping, and for fastening parts to the automobile chassis frame.

Pins are made of chromium-molybdenum steel: and are so shaped that they penetrate the plate without punching a slug therefrom. Mr. Shepard described the action as one wherein the first small hole is expanded so rapidly that inertia effects cause the hole to be momentarily greater in diameter than the tail of the pin. Elastic forces soon counteract these inertia effects and the hole shrinks so rapidly that the flying pin is caught before it gets entirely through and is held so tightly that about 20,000 lb. pressure would be required to force a ½-in. pin out of a ¾-in. plate.

Mr. Shepard thinks that this principle of "electric propulsion" can also be applied to the process of forging between dies.

German Ship Plate Not Unusually Corrosion Resistant

It has been reported that the ship plates on the hull of the Leviathan are showing an unusual resistance to corrosion. (This ship was completed in 1914, by the firm of Blohm & Voss, of Hamburg, Germany, and had made one transatlantic voyage as the Vaterland when the war broke out, and she was interned at New York.) In an attempt to verify these statements the United States Bureau of Standards has compared the corrosion of plates taken from the hull with open-hearth steel of similar composition made in America. One test series contained copper from a trace up to 0.60 per cent. Test methods consisted of continuous immersion and wet-and-dry cycles in sea-salt and common salt solutions.

No outstanding difference in the results could be discovered which could be referred to variation in composition. However, the submersed corrosion was much less than the wet-and-dry, although the latter goes forward at diminishing rate as time builds up an adherent coating of magnetic oxide. The conclusion is, that if the Leviathan hull is due for a long life, it will be because of service conditions, the exact nature and influence of which are not known rather than from the chemical composition of the steel used.

Scrap Consumption Is Growing

Indications Point to Increasing Use of Old Material in Steel Making—Trends in Business Mean Smaller Profits for Dealers

BY C. E. WRIGHT*

CHANGING trends in the buying and selling of iron and steel scrap have been apparent in the past few years. Large accumulations in the yards of mills and scrap dealers are pretty much a thing of the past. As with many other commodities, purchases by mills and other large consumers are more nearly on a hand-to-mouth basis. Wide fluctuations in prices, which sometimes before the war afforded profits running into dollars per ton, are less frequent, though they sometimes occur during periods of such exceptional activity as we have had recently.

We have seen in recent years a new consciousness on the part of the user of scrap of the importance it plays in his costs. Likewise, the large producers of scrap have a definite place for scrap in their system of accounting; this is shown, for example, by the recent statement of a large automobile company that its scrap sales bring about $1,000,000 per year into its treasury. In many manufacturing plants the recovery of scrap is definitely figured on in consideration of the cost of new material. More and more manufacturing companies whose scrap production runs into large figures have put in expensive machinery for such operations as baling light sheet scrap, crushing turnings, briquetting cast iron borings and such special operations as separating Monel metal from turnings by means of a magnetic separator.

The greatly increased production of compressed sheet scrap and the freer acceptance by the steel mills of this grade at prices comparable with those paid for the better grades of heavy melting steel indicate that there will be from now on a more scientific valuation of scrap and a more widespread effort to recover much of what has recently gone to waste. The business-like manner in which old automobiles are now turned back into the blast furnace or the open-hearth furnace is a case in point. We expect to see a growing number of private plants in industrial centers equipped on a large scale to gather and compress sheets and other light scrap.

There has been a marked tendency to put the scrap business virtually on a manufacturing basis. The railroads and other large producers of industrial scrap are now selecting and preparing their material with a definite knowledge of the consumer's requirements. The yard which sorts mixed scrap has to a large extent been obliged to practice this segregation.

Changed Attitude of the Steel Mills

THE scrap trade has probably been somewhat spoiled in years gone by through the fact that many mills were willing to take what was shipped to them, although they might make a small cut in the price. But when the mills became more exacting in their requirements, there were many complaints from the scrap trade. The more rigid attitude of the mills has been forced on them in part by the narrow margins of profits in finished steel in recent years, the tremendous urge to cut production costs and the insistence of the mill consumer on steels of high quality. Perhaps the mills were at times too lenient with the scrap trade and at other times too severe.

It is undoubtedly a better policy for the buyer to have at all times a definite set of specifications which the scrap trade will understand and adhere to. Those who do business in the East know that the adoption of fixed specifications and fixed differentials by one large Eastern buyer has done much to clarify the situation in the Eastern territory.

There is a growing tendency on the part of some buyers to make contracts direct with scrap producers. Yet, there are few industries in which the middleman—the broker or dealer—is so essential as in the scrap trade. The elimination of the middleman has been brought about in many instances by the desire of the mills to obtain a portion of their scrap from sources which can be depended upon to give them the same grade and quality of scrap at all times. Thus we have steel companies which take back plate and structural scrap from scores of their customers; they are sure of the quality because it is steel made in their own furnaces.

Contracts Made on Trade Paper Prices

Most of the contracts that the large consumers enter into with producers of scrap provide for price settlement on the basis of trade paper quotations. We have abundant testimony in the mail which reaches our office of the extent to which such contracting has grown in recent years. One large purchaser has more than a hundred contracts which are settled on trade paper prices. This fact does not lighten the task of market reporters to arrive at accurate quotations, always a difficult one, especially in times when transactions are few and far between. However, this function is one of the responsibilities which a business paper assumes in trying to give the utmost service to its readers and we do not shirk it. But we cannot be responsible for all the queer ways in which contracts are sometimes made and which very often bring losses to the scrap man.

One of the most complicated phases of this situation relates to the scrap which moves on contracts from Detroit to Pittsburgh and to mills lying between Detroit and Pittsburgh. Most of these contracts are based on Pittsburgh quoted prices, less freight. A shipment of Detroit scrap purchased at the Pittsburgh prices less $4 freight and shipped to Youngstown nets the dealer the difference between the freight to Youngstown and Pittsburgh, or 47c. a ton, as the rate to Youngstown is $3.53 against $4 to Pittsburgh. The saving in freight is greater if shipment is made to Canton, Massillon, Mansfield or Cleveland when Detroit is the originating point.

The competition for Detroit scrap contracts is so keen on account of the fact that most of it goes to points between Detroit and Pittsburgh that dealers not only do not keep their bids on the basis of the range of prices quoted in the Pittsburgh market, but sign up to pay the maximum and even a premium on that. Unless THE IRON AGE Pittsburgh prices lean to the lower rather than the higher limit of what is actually being paid, the dealer is in a fair way to lose money, because the buying price is too high in relation to what can be obtained even on shipments within a low freight zone from originating points.

It might be well for scrap dealers who make contracts based on prices quoted in THE IRON AGE to study the contracts carefully before signing them because THE IRON AGE cannot enter into controversy with either party when a bad contract or a care-

*Associate Editor THE IRON AGE. From a paper read before joint meeting of New York and New Jersey chapter of Institute of Scrap Iron and Steel at Pennsylvania Hotel, New York, Jan. 30.

less contract has been made. The desire to do business unfortunately leads scrap dealers into contracts that must, under some conditions, fail to yield a profit.

THE IRON AGE has only one interest, and that is to make its quotations as nearly representative of the actual market conditions as is humanly possible. The quoted prices are based on actual sales to mills and other consumers when they are buying and on transactions among dealers when such trading is the only market activity.

The correction of conditions relating to contracts which do not work out profitably for the scrap dealers is entirely in the hands of the dealers. They need to be sure that these will work out fairly under unfavorable as well as favorable market conditions. THE IRON AGE would be faithless to the confidence that is reposed in it if it recorded prices that were tinctured for the particular benefit of either consumers or dealers. We cannot let the fact that contracts are made on our prices influence us except to see that prices published represent as faithfully as possible the prices that are actually being done.

Short Sales Often Mean Small Profits

Many of the difficulties of the scrap trade are not so apparent in a quiet market as in an active market, such as we have had in recent months. The short sale is undoubtedly one of the reasons for small profits in an advancing market. Take a recent incident in the Pittsburgh district as an example. A mill placed a substantial order with one dealer at $18.75, delivered. Within a few days it had covered on a portion of the order, paying $18.25 to its sources of supply. But by that time the same mill had given two or three orders to other dealers at $18.75, and then there were three or four scrambling for available material to cover their orders. One or two of them eventually got up to $19.50 to cover an $18.75 contract. Those mills which confine their purchases to one or two dealers and refuse to buy from others except at 50 cents or 75 cents under the price just paid are protecting the dealer in his legitimate profit and are helping to prevent the market being run up on themselves.

Some consumers prefer to make their purchases through one broker to avoid competitive bidding for their scrap supplies. Recently a fairly large buyer of scrap complained to us that every time he came into the market for a few thousand tons the price was jacked up fully 50 cents a ton. When the company was ready to buy, a price was decided upon that was considered fair in view of prevailing market conditions and offers of tonnage at this price were made at the same time to several brokers. The result was that, except possibly in very dull times, the prices quoted a few hours later were uniformly higher. Then this buyer did what some other consumers have done—he appointed a scrap broker as his exclusive purchasing agent. The broker presumably makes a fair profit, and being constantly in touch with sources of supply, he keeps the price range within a narrow fluctuation. Since Oct. 1, the prices of the grades this company buys have fluctuated scarcely more than 25c. or 50c. a ton, despite the generally stronger market for other grades.

High Degree of Speculation Virtually at End

It seems fairly certain that the high degree of speculation which existed in former years is virtually at an end. Scrap trading is being established on a basis of quick turnover, small stocks and low profits. There may be brief periods when prices will rise sharply, as they have recently, but such price spurts are usually not so profitable as they were in former days when they came with more regularity. It will require henceforth a higher degree of business ability and less of the speculative instinct to keep the books in black ink.

When the steel trade is pushed hard for shipments, as it was last fall and as it may be again during the next month or two, it will buy scrap freely at almost any price, but under average conditions it will utilize its ample blast furnace capacity to cut down on the consumption of scrap and reduce prices to a point where scrap is actually profitable as compared with pig iron.

The enormous capacity of the modern blast furnaces will make this possible. Consider, for example, that in 1928 the average daily rate per blast furnace operating was 515 to 560 tons, while in 1926, a year of large production, the average daily rate was 460 to 497 tons—an average gain during that short period of 60 tons a day per furnace. This daily average will go higher as new and larger furnaces come into operation and the smaller and older furnaces are scrapped, a process that is steadily going on. Without this large blast furnace capacity, scrap must have gone much higher in the past year than it did, considering that the actual consumption probably broke all records.

Use of Scrap Shows Upward Trend

As to the future, one of the items that must especially interest the scrap trade is the astonishing and progressively increasing volume of scrap that has been in demand in recent years. If these trends continue with substantially no deviation, and there is every indication that they will, it would be reasonable to wonder if new sources or new methods of recovery will not have to be discovered. Perhaps a closer combing of scrap-producing fields will suffice, until a new economic situation develops as may now merely be conjectured.

It need only be mentioned that in the last five years the amount of steel made (in form of ingots) was 40,000,000 tons in excess of the output of pig iron, and this gap made up by scrap is in addition to the increased use of old iron and steel for other than steel-making needs. With the greater permanence of present structures—to mention steel railroad cars for one thing—one would naturally expect increasing difficulties in amassing the year-by-year expansion of scrap demand of the present-day colossal proportions.

Steel production is proceeding at an annual increase of 1,013,000 tons, whereas the annual increment of pig iron output has been averaging 423,000 tons. This means that every year for the next few years average consumption will require 590,000 tons more scrap at least than it did the year before.

Only as recently as the years just before the war, tonnages of production of steel ingots and pig iron were on a parity. In 1913, for example, both were around 31,000,000 tons. Since the war, the expansion in steel has been at a much higher rate than that of pig iron, until the excess of the steel ingot tonnage over the pig iron was more than 12,200,000 tons in 1928, following three years in which the excess of steel over pig iron averaged 7,400,000 tons. In the 15 years since 1913, the annual pig iron consumption has shown an increase of 22 per cent, but the increase in steel has been nearly 2½ times that, or 53 per cent. The indication is that over the next five years the output of steel ingots will be 60,000,000 tons in excess of that of pig iron, representing one big channel of consumption of scrap.

For those in the scrap trade who will do business according to the changed situation, there should be ample opportunity for normal profits. It appears certain that a growing percentage of the increasing steel production will be made from old material and new industrial scrap, and there will always be occasion for dealers to handle a large part of this scrap.

The Central Alloy Steel Corporation, Massillon, Ohio, has just completed a battery of 15 new by-product coke ovens at its United plant at Canton. These will be placed in operation this month. With 62 ovens at Canton and 49 at Massillon this corporation will have a monthly capacity of 45,000 tons of blast furnace coke. Complete by-product plants at both Canton and Massillon supplement the coke-producing equipment.

A new line of limit switches is announced by the General Electric Co. They bear the designation LS-429 and are expected to be of especial value in the steel industry and on such applications as skip hoists, car dumpers and other machines requiring geared type switches.

Electric Open-Hearth Door Hoists

Use of Only One Motor for Each Furnace Saves in Installation and Maintenance Costs

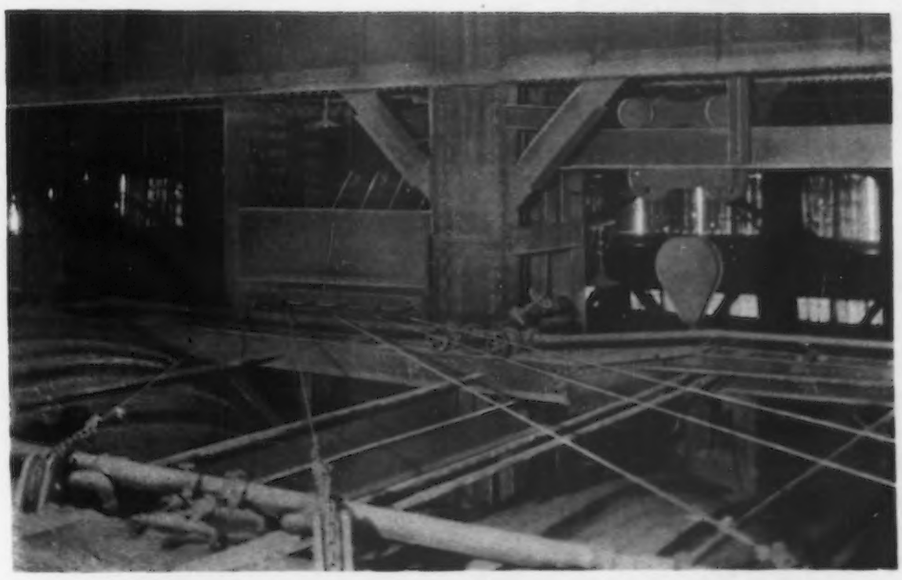
THERE are two ways to operate furnace doors electrically: One is to have a separate motor and separate hoisting mechanism for each door; the other is to have all of the hoisting mechanism combined in one place, all operated by a single motor to the furnace. This is the principle of the Blaw-Knox electric door hoist, which is back of the furnace, out of the way.

In this hoist the motor operates a main shaft, which in turn actuates the pulley sheaves on which are wound, with a single turn, the cables leading to the various furnace doors. These cables cross the furnace top and carry the door on one end and a counterweight on the other end. The five counterweights are shown in one illustration. By this arrangement the cables are always taut and there is no play or lost motion between the counterweight and the door.

When the operator wishes to move a certain door, he presses with one hand the button corresponding to that door, and with the other hand presses the button starting the motor. The motor being started and the solenoid being actuated to operate the clutch, the mechanism for that particular door is put in motion. The door is moved and keeps moving until the release of the buttons shuts off the current. The operator has complete control, being able to move any door in either direction any desired amount. When he stops it, by releasing pressure on the buttons, a powerful brake is applied and the door stays "put."

If the operator should fail to release the buttons no harm would be done, for the door would simply move to the top or bottom position and stay there. As the cable leading to the counterweight takes but a single turn around the operating pulley, the pulley would slip around inside the loop of the cable. The counterweight balances the entire load of the door, so that the only power required is that necessary to overcome friction. The tension in the cable also keeps

MAIN Hoist (right), Showing the Counterweights (in the "Cage") and, at Left of Picture, the Cables Leading to the Five Doors. The solenoids, brakes, clutches, gears and drums are all held in the cage structure



INSTALLATION of Electric Hoists for Open-Hearth Furnace Doors. Above is push-button control station on charging floor

TOP of Furnace (left), with Taut Cables from Door Sheaves to Sheaves of Centralized Hoisting Mechanism

the door in a vertical position and close to the furnace and always tight, saving fuel and heat.

Power is from a 2-hp. motor, which operates only when one of the doors is being moved. Thus the operating cost for electricity is negligible and maintenance is on the basis of one motor only, instead of five. The door hoist is a compact unit mounted off the floor in what is usually waste space, back of the furnace.

Cylinder Sleeves Bored or Reamed at High Rate

CYLINDER sleeves are rough, semi-finish and finish bored or reamed four at a time on a new four-spindle fixed-center single-purpose machine designed by the Defiance Machine Works, Defiance, Ohio, to meet the requirements of tractor and gas engine manufacturers. Production of 50 to 100 sleeves an hour is claimed for the machine, which is designated as the No. 8.

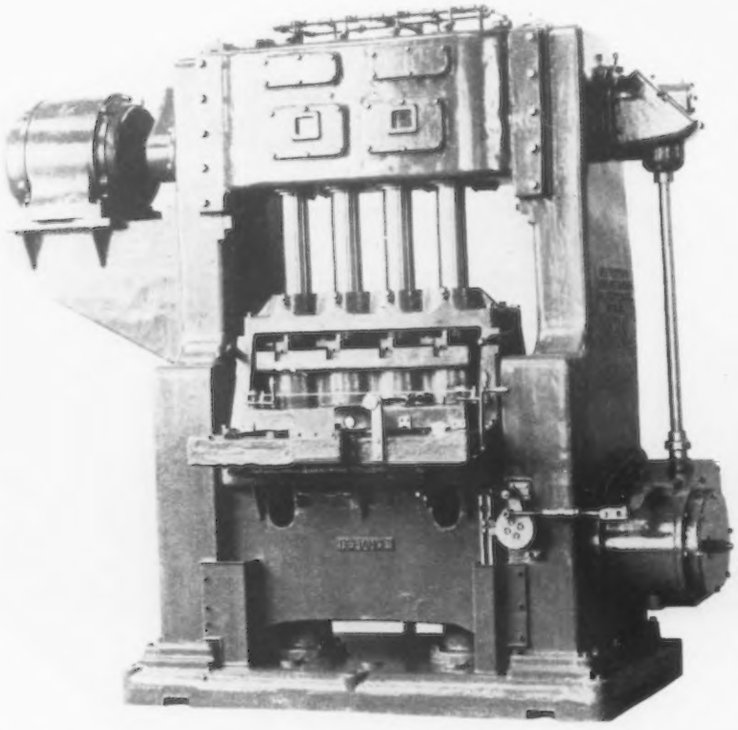
The machine is heavy and rigid throughout. The frame and base castings are broad, have cored centers, and are heavily ribbed. The slides, which are broad and long, are scraped and gibbed. The feed mechanism is of unit construction and is accessibly located. It is tightly incased and retains a sufficient level of oil to provide a splash system of lubrication.

Feed changes are made by removing the cover of the gear case and changing two gears. Hand adjustment for table feed is provided, but when the machine is in operation the table automatically feeds the work up to the boring tools at rapid traverse and when through the cut, it automatically reverses to a fast travel, returning to its loading position and stopping until engaged to bore the next cylinder. By means of double clutches in the feed box the machine can be set to feed, disengage, rapid travel up, feed again, disengage and automatically return.

The spindles can be belt driven from a three-step cone pulley or from a motor connected with flexible coupling direct to the drive shaft. They are of alloy steel, of large diameter and are supported by three bronze bearings. The nose bearing is conical in shape and is provided with adjustment for wear. A friction brake serves to arrest the momentum of the spindles after the power is shut off. The boring tool is fitted to the spindle by a tapered shank and is held in place by a long bolt extending through the spindle from the top.

The center section of the fixture is mounted on a sliding table operated with an air cylinder for opening and closing. The cylinder is equipped with a pressure gage and air reducing valve to be set at 60 lb. pressure. The top of the fixture is supported with a bushing plate and hardened jig eye to pilot the boring bar before entering the cut. Two jack screws of large diameter are used for raising and lowering the table, each screw being actuated by a heavy worm and worm gear through a bronze nut, which is sleeved to the worm gear. Moving parts of each jack unit are packed in grease. A simple adjustment provides for advancing or retarding the screws independently to maintain alinement of the table.

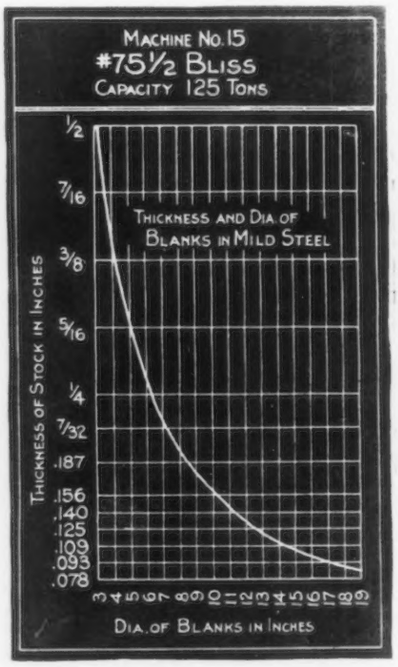
Floor space of 48 x 118 in. is occupied by the machine, the net weight of which is 18,000 lb.



Gas Engine Cylinder Sleeves Are Rough, Semi-Finished or Finish Bored or Reamed at the Rate of 50 to 100 Sleeves per Hour

Safeguarding Machines by Limiting Their Work

A CONVENIENT method of placing a limit upon the magnitude of work put into a given machine is brought out in the appended diagram. This is representative of a series used by the Mossberg Pressed Steel Corporation, Attleboro, Mass., in



Visualizing Safe Limits in Size of Task Given a Machine to Perform

safeguarding presses and other equipment from over-strain. The diagram, of course, is made to match the capacity of the particular press to which it applies. It permits the press foreman, as well as the tool setter, to observe the limit in size of blank which can be punched safely on each unit in the department.

As will be observed from the diagram, the curve permits increased diameter as the thickness of stock decreases. This particular diagram relates to mild steel. Similar limits for other materials may readily be established.

Bullard Co., Bridgeport, Conn., has published a 76-page book, profusely illustrated in rotogravure, on the Mult-au-Matic method of machining metal parts. The book is not a mere catalog, but a thorough description of the wide range of work done on this machine, with time study data, comparisons of costs and other information of value to the manufacturer who is doing a mass or a near-mass production job.

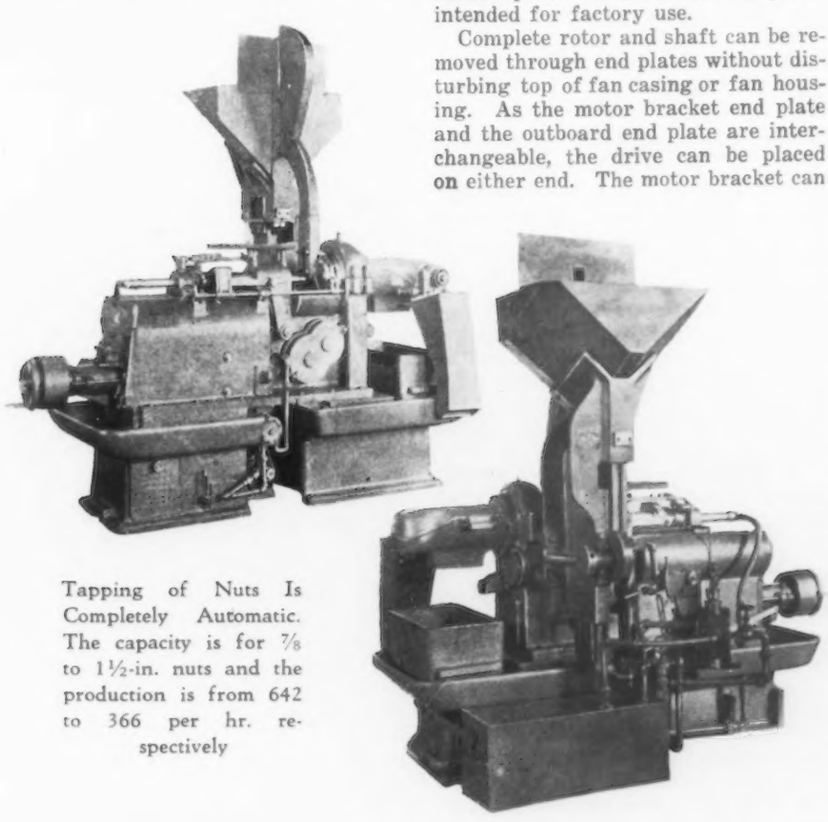
Automatic Tapping Machine for 7/8 to 1½-In. Nuts

USE of a hydraulically-operated hopper having a plunger feed is a feature of a new and larger automatic nut tapping machine that has been placed on the market by the Automatic Nut-Thread Corporation, 3617 North Eighth Street, Philadelphia. Except for the hydraulically-operated hopper, the plunger of which raises and lowers to feed the nuts into the chute through which they pass to the tapping spindle, the machine is similar to the company's No. 2 nut tapper described in THE IRON AGE of Sept. 22, 1927.

Operation of the machine, designated as the Threadnut No. 3, is fully automatic after the nuts have been loaded into the hopper, which is of welded sheet steel and of ample capacity for the larger sizes of nuts. A safety clutch throw-out serves to stop the machine automatically should any obstruction prevent proper feed of the nut on to the tap, thus preventing breakage either of the machine or the taps. The arrangement is such that after the obstruction has been removed from in front of the plunger, the machine may be started by simply throwing in the main clutch lever. Taps used are of the bent shank design and are held in place in a floating position by a train of nuts on the shank. Coolant fed through the plunger under pressure plays directly into the tapping jaws and on to the tap, keeping the tap cool and serving to wash away any accumulation of chips.

Speed change gears operated from controls at the end of the machine are provided, and two sets of change gears are furnished for the feeding cam; one set being for U.S.S. and the other for S.A.E. threads. The machine is equipped with a forced feed lubrication system, the lubricant being carried to all moving parts by small oil lines. Separate reservoirs are provided for the lubricating oil, coolant and the oil for the hydraulic hopper mechanism. Ball bearings are used throughout except for the spindle and backshaft, which are mounted on Timken roller bearings.

Production per hour in tapping the various sizes of U. S. Standard nuts is as follows: 7/8-in., 642; 1-in., 552; 1⅛-in., 477; 1¼-in., 440; and 1⅜-in. and 1½-in., 366.

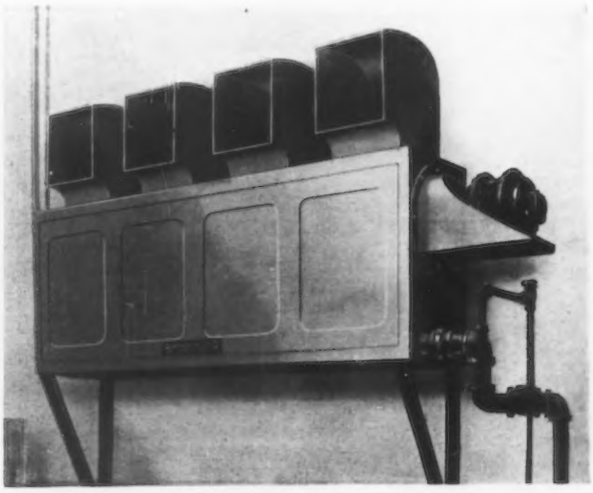


Tapping of Nuts Is Completely Automatic. The capacity is for 7/8 to 1½-in. nuts and the production is from 642 to 366 per hr. respectively

Buffalo Lowboy and Highboy Unit Heaters

A NEW line of unit compact heaters is being put out by the Buffalo Forge Co., Buffalo. These heaters are of two types, the Lowboy and Highboy. The Lowboy consists of one section of paneled casing, while the Highboy is made up of two sections. They are intended for factory use.

Complete rotor and shaft can be removed through end plates without disturbing top of fan casing or fan housing. As the motor bracket end plate and the outboard end plate are interchangeable, the drive can be placed on either end. The motor bracket can be revolved to any position of discharge. The heating element is made up of universal aerofin suitable for pressures from 2½ to 150 lb. gage.



Self-Contained Industrial Heater of Flexible Design. This is the lowboy type; the highboy, taller and narrower, has similar details of construction and operation

Aerofin is a fin-tube heater, light in weight, highly efficient and non-corrosive. This heater element can be removed from either end of the unit through end plates. It can be assembled with steam or drip connections on either end as desired. The multirotors are of the centrifugal type, each in its own fan housing, designed to deliver a large volume of air quietly and efficiently. The rotor is of the multiblade type, using a modified backward tipped blade, which is positive in its air delivery and will effectively force the warm air over a large working area.

These heaters have a wide range of adaptability. The width is purposely kept down to the minimum so that they will fit in conveniently between girders and beams. They can be installed vertically, horizontally or inverted. They are suitable for floor mounting or wall bracket mounting, or for ceiling suspension.

To protect against failure of voltage in power circuits after a suitable interval has elapsed, the General Electric Co. has introduced two new equipments bearing the designations MG-2 and PF-2. These are especially designed to trip the breaker in the circuit only after a suitable time interval, and will not cause interruptions to service when momentary voltage dips occur.

Modernized Extra-Heavy-Duty Engine Lathes

COMPLETELY redesigned and modernized "extra-heavy-duty" geared-head engine lathes, in 42, 48 and 60-in. sizes, have been announced by the Wickes Brothers, Saginaw, Mich. The machines have unusually large members and, with the exception of the main spindle bearings, are equipped with ball and roller bearings throughout.

All sliding gears in the headstock are mounted on splined shafts. Shafts are of high-carbon chrome-nickel steel, heat-treated and ground to size, and the teeth of all gears are rounded to assure easy sliding engagement. Levers on the front of the headstock provide for the selection of 16 spindle speeds ranging from 2 to 200 r.p.m. The handwheel at the extreme right-hand end of the headstock is employed for engaging and disengaging the triple-geared faceplate drive. Spindle speeds from 2 to 50 r.p.m. are obtainable through the faceplate drive and speeds ranging from 8 to 200 r.p.m. through the direct drive. A lever at the extreme left-hand end of the headstock is used to reverse the leadscrew for cutting left-hand threads.

The main spindle is made from a solid high-carbon steel forging and has its journals ground and burnished to size. Spindle thrust is taken on a ball thrust bearing. The headstock is filled with oil to the level indicated on a sight gage glass at the front, and in addition to the splash system for the gears, clean oil is pumped to each bearing.

For the main drive a constant-speed, 1200-r.p.m. motor is recommended. The motor may be mounted either on the headstock or on the floor at the back of the lathe, and the power transmitted by belt with tightener, or by silent chain or gearing. The main drive clutch is of the design used on previous Wickes' lathes. It consists essentially of a driving ring with fiber inserts, an outside driving plate, an inside driving plate and means for clamping the friction inserts between the two driving plates. The clutch may be adjusted conveniently for wear from the outside of the clutch housing, without removing the covers or other parts. Movement of the clutch lever at the operator's position in one direction engages the main driving clutch, while a reverse motion disengages the clutch and applies a friction brake.

The compound rest is of heavy construction and its swivel is bolted to the lower side by four bolts. The top side is arranged to give minimum overhang at the most extreme setting. The swivel is graduated for any angle up to 90 deg. Adjustable taper gibs provide take-up for wear. Power angular feed is provided.

The carriage is heavy and has extra long wings that have bearing on the vees for their entire length. It is well gibbed, front and rear, has a wide dovetail for the cross-slide and a heavy bridge. Shear wipers are provided. The cross-feed screw is of nickel steel and, with the compound rest screw, has collars with micrometer graduations and ball thrust bearings to take end thrust. Motor driven power rapid traverse of the carriage, both longitudinally and cross, can be provided. The apron is of double-plate design. Levers for engaging and disengaging the bevel pinion for power feed of the carriage and the nut on the lead screw are interlocking, it being impossible to move either lever unless its companion is in its neutral position.

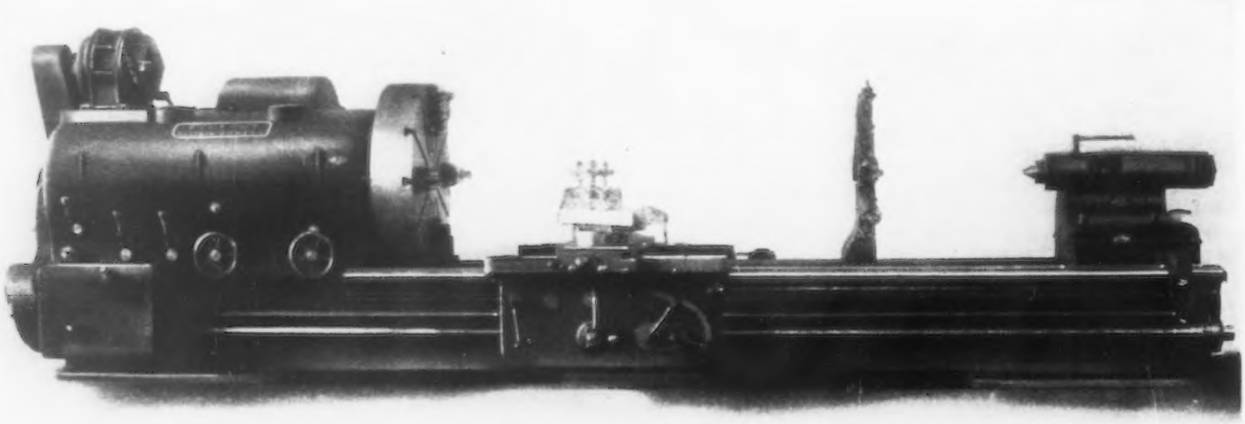
A taper attachment of improved design, featuring both simplicity and convenience, is permanently bolted to the back of the carriage, with which it moves, and is always ready for use. This attachment has a range of 2 in. taper per ft. on each side of the center line and has a travel of 30 in. in length at one setting.

Theb bed of the machine is heavy, and in lengths up to 30 ft. 6 in. is cast in one piece. The longer beds are in two pieces, have machined joints and are bolted and doweled together. The tailstock is of adjustable overhanging design, which permits wide range of adjustment at different angles of the compound rest. The tailstock spindle, of high-carbon steel and ground and lapped to size, is moved by means of a crank and steel screw which runs in a renewable bronze nut. The spindle adjusting crank is conveniently located.

The quick-change gear box unit, having steel gears with teeth cut from the solid and rounded to assure easy sliding engagement, provides a wide range of thread and feed changes. Longitudinal feeds range from 0.024 to 0.723 in. per revolution of the spindle and cross-feeds from 0.009 to 0.271 in.

With a 16-ft. 6-in. bed the weight of the 42-in., 48 and 60-in. lathes is 41,000, 42,200 and 45,000 lb. respectively. The actual swing over the bed is 44, 51½ and 61 in.

A "modernized" line of heavy-duty engine lathes in 36, 42 and 48-in. sizes has also been brought out by the Wickes company.



Unusually Large Members Are Employed and Ball or Roller Bearings Are Used Throughout, Except for the Main Spindle. Controls are conveniently located and the taper attachment, which is bolted to the carriage, is always ready for use

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Electric Furnaces in the Iron Industry

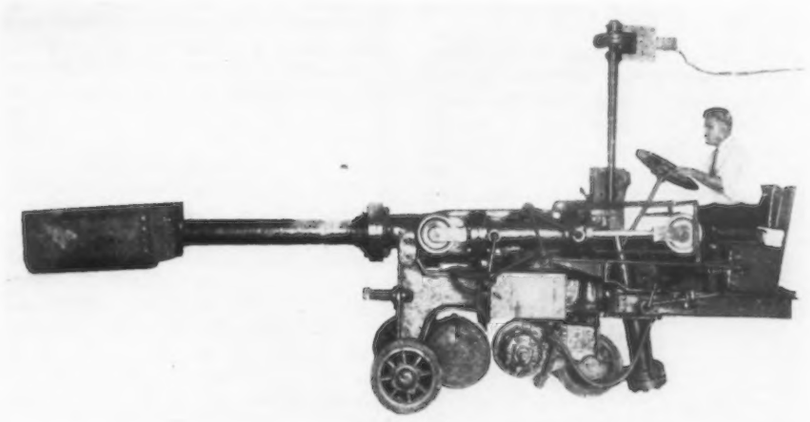
A pamphlet of 7 pages, illustrated, dealing with the use of the electric furnace in the iron and steel industry is reprinted from a paper by John G. Webb, which was published in the Stone & Webster *Journal* for January. Mr. Webb, who is manager of the electric steel plant, Old Dominion Iron & Steel Works, Richmond, Va., is using furnaces which he developed at that plant some years ago, and which were described in THE IRON AGE of Aug. 1, 1918.

He tells some of the advantages of melting under the close control that this equipment permits, and says that one expert melter and his helpers can produce 18 tons in 10 hr. with the two furnaces he is using, compared with which it would take nine double puddle furnaces, with four trained melters to each unit, to turn out the same quantity.

Furnace Charger for 1 and 2-Ton Loads

With Auto-like Operation Serves Heating Furnaces, Cupolas, Presses, Hammers and the Like.

AN auto floor charger for serving heating furnaces, open hearth furnaces of small capacity, cupolas, hammers and presses, is a recent development of Edgar E. Brosius, Inc., Pittsburgh. It is built in two sizes, one to handle loads up to and including 2000 lb., and the other up to and including 4000 lb.



The Brosius Floor Charger May Be Equipped to Handle Billets by Replacement of Rotating Element with Conventional Form of Tongs

The machine, which is mounted on rubber tires, requires only small floor space for its operation. The tractor wheel is driven through spur gears by a motor mounted on the tractor and the machine is steered through a pair of bevel gears, the steering wheel being of the standard automobile truck type. The tractor, mounted on a vertical shaft supported by Timken roller bearings can turn at right angles, and this permits the charger to turn on its own wheel base. The front wheels also are equipped with Timken roller bearings and the tilting and rotating of the peel are done by means of hydraulic cylinders actuated by a motor-driven rotary oil pump.

Several installations of different types of this machine now are in use, and maintenance is reported as remarkably low, while the speed of operation is very fast. Skill in handling the machine is easily acquired as it drives like an automobile.

For handling billets, ingots, etc., a peel with a conventional type of tongs is provided in place of the rotating peel as shown in the illustration, which is of a machine built for handling a charging box and serving a 15-ton open hearth furnace. The machine comes complete, and a flexible cable to the top of the mast of the machine is the only accessory the purchaser must provide. It can be operated on either direct current or alternating current.

Patents are pending or allowed in this and foreign countries.

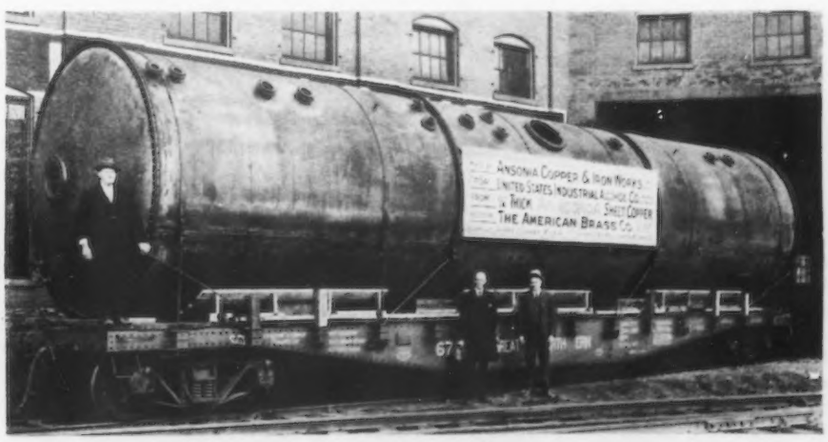
Silver Solder for Joints in Copper Still

THAT fabrication in other metals than steel can assume unusual proportions is demonstrated by the adjoining view of an alcohol still made of copper. It is 10 ft. 6 in. in diameter and 51 ft. long, and weighs 14 tons. It was made by Ansonia Copper & Iron Works, Cincinnati.

Not only does the size probably break all records, but the method of construction is unique. Most alcohol stills have previously been welded with the oxy-acetylene flame using Tobin bronze welding rod. This gives a joint of satisfactory strength, but it is attacked slowly by the weak acids and other chemicals like butyl acetate which remain behind in the distillation process.

One of the silver solders made by Handy & Harmon, New York, was tried as a substitute. This not only gave the required resistance to corrosion, but sample welds in ¼-in. copper plate were strong enough to force failure in the plate itself. The joint is made with the oxy-acetylene flame, using silver solder wire as a welding rod, and requires no specialized technique.

The still is made of nine copper sheets, 133 x 195¼ x ¼ in., weighing 1 ton each, and two dished ends 133 in. diameter by ¼ in. thick, weighing 1350 lb. each. Within the shell is a system of copper tubing (also jointed with silver solder) weighing about 4 tons. These coils passed a 200-lb. hydrostatic test without leakage. The main shell was tested at 5 lb. pressure.



Record-Breaking Exports of Agricultural Implements

WASHINGTON, Feb. 1.—Reaching a total of $116,615,244, exports of American agricultural implements in 1928 for the first time exceeded $100,000,000, according to the agricultural implements division, Department of Commerce, and were $25,868,318 greater than they were in 1927. The 1928 movement established a new high record after 1926 and 1927 had successively exceeded all previous years in volume of exports.

Increases were made in all classes except drills and seeders, sprayers and dusters, mowers, grain harvesters and binders, and towers and parts of windmills. The decreases in mowers and in grain harvesters and binders were slight, however, and were more than offset by the 91 per cent increase in exports of combines, of which 7317 valued at $10,448,568 were shipped to foreign customers in 1928.

Exports of wheel tractors showed an increase in value of $10,339,503, despite a decrease in number. The total shipped in 1928 was 53,858, valued at $44,230,835, against 56,662, valued at $33,891,332, in the preceding year. This, the division pointed out, showed a considerable increase in the unit value of wheel tractors exported, and indicated a cessation in the shipments of lighter types of wheel tractors in favor of the heavier types.

Manufacturers Favor Price Maintenance

Federal Trade Commission Survey Indicates Wide Approval of Legislation Affecting Trademarked Articles

WASHINGTON, Feb. 5.—Manufacturers and independent retailers are decisively in favor of legislation permitting resale price maintenance, and wholesalers are even more strongly for it, while chain and department stores and consumers are vigorously opposed to it.

These facts are disclosed in a preliminary report made last week to Congress by the Federal Trade Commission on its inquiry into the subject. Recommendations of the commission will be submitted in its final report which will consist of the second of the two volumes which make up its study, begun upon its own initiative and authorized on July 28, 1927.

The inquiry deals with every conceivable aspect of the subject and is based on questionnaires sent out to manufacturers, wholesalers, retailers, consumers and professional men. Of the 60,000 questionnaires sent out approximately 8000 replies were received. In addition to sending out questionnaires, the commission did much work through field agents.

There is now pending in Congress the so-called Kelly-Capper bill which would legalize resale prices on trade marked, nationally advertised products, and the subject has been the object of proposed legislation for the past decade, having been defeated each time it came to a vote. The inquiry of the commission was the broadest of the kind ever made and is intended to aid Congress in its study of the question. An outstanding feature of the preliminary report is the fact that eight out of 10 farmers making replies to the questionnaires were opposed to resale price maintenance, the opposition from other consumers being somewhat less marked.

Metal-Working Manufacturers Favor Price Maintenance Legislation

Of 6000 manufacturing concerns to which questionnaires were sent, 849 addressed returns which served as the basis for a report from this group, 617 or 72.7 per cent voting in favor of legalization of price maintenance. Opposition was registered by 183 or 21.5 per cent, the remainder having made indefinite or no replies. The manufacturing groups included iron and steel products, machinery, automobiles, automobile accessories, other metal products, and eight other lines, 13 in all. Iron and steel products as classified in the report included hardware, bench and machine tools, firearms, household appliances, kitchen utensils, plumbers' supplies, stoves, etc., wire cloth and "miscellaneous," while machinery included agricultural implements, electric equipment, lawn mowers, pumping apparatus and radio apparatus. Other metal products consisted of clocks and watches and jewelry and silverware.

Of the 150 returns received from the iron and steel products' lines, 86.2 per cent voted in favor of price maintenance, while 20 per cent were opposed; the machinery interests made 43 returns with 91.4 per cent in favor of price maintenance and 2 per cent opposed.

On the question as to whether, under resale price maintenance, the manufacturer should have the right to establish a single fixed price for wholesalers and another for retailers, or a minimum price for each, or whether in preference to either plan, they should have the right to choose their own price basis, there was response from 778 manufacturers, 71 making no reply. As between a single fixed price for each class of distributers and a minimum price for each, there was practically no difference in numbers, 180 favoring the former plan and 179 the minimum price basis. The right of the manufacturer to choose his own price basis, however, appears to have been the most popular, the number favoring this plan being 319 or 41 per cent of the total replies received, compared with 21 per cent for each of the other two options named.

Majority Favors Quantity Discounts if Resale Prices Are Made Legal

Of the total replying to the question as to whether manufacturers should be permitted to give quantity discounts, in the event resale price maintenance is made legal, 586 or 69 per cent voted affirmatively while 140 or 16.5 per cent voted against the proposal. There were 126 favorable replies from the iron and steel group, representing 72.4 per cent of the total number responding, while 28 or 16.1 per cent were opposed to granting of quantity discounts. Eighty per cent of the replying machinery producers voted in favor and 8.5 per cent voted against the granting of quantity discounts.

It was generally conceded that advertising tends to increase the volume of distribution. One-half of the manufacturers returning questionnaires stated that distribution was increased by advertising and 6 per cent stated that advertising has had no effect on the distribution of their product.

Although 617 manufacturers indicated that they favored resale price maintenance, only 264 or 31.1 per cent of the 849 manufacturers returning questionnaires offered one or more suggestions as to what should be included in the law. The suggestions ranged from mere legalization of price maintenance contracts between manufacturers and their dealers to modification and even repeal of the Sherman act, the Clayton act, the Federal Trade Commission act and any other legislation that may restrict manufacturers in their efforts to fix or control prices. Many of the more concrete suggestions centered about giving greater latitude of action to manufacturers in dealing with price-cutting dealers.

Industrial Relations Work Spreads to Small Plants

Organized programs for the improvement of employer-employee relations have spread to smaller plants to a surprising extent, according to an investigation by the National Industrial Conference Board, New York. Although the cost of industrial relations work is proportionately higher with the decreasing size of establishments, small plants having such programs were found to pay higher average wages than those which do not engage in such activities. Industrial relations activities apparently yield a return in productive efficiency even though it cannot be accurately measured in dollars and cents.

Some forms of industrial relations work are not practicable in small plants. The required financial resources may be inadequate to put a given plan into operation, the necessary space or equipment may be lacking, or the personnel may be too small to permit participation in a project designed for large numbers of wage earners. Among the features of programs in larger plants that may not lend themselves to adoption are group insurance, mutual benefit associations, plant lunch rooms, industrial pensions, dispensaries, clinics and hospitals, foreman training courses and other educational classes, athletic activities, employee housing and company stores. On the other hand, financial incentive plans, bonuses for length of service, attendance, punctuality or quality of work, and profit sharing plans are proving successful in small establishments.

The board's investigation was confined to plants having not more than 250 employees, which comprise 96½ per cent of the number of manufacturing establishments in the country, although employing only 47 per cent of the total number of factory hands.

Wisconsin Steel to Build New Blast Furnace

An expansion program calling for an expenditure of about $2,000,000 has been announced by the Wisconsin Steel Co., Chicago, subsidiary of the International Harvester Co. This will include a new blast furnace at its South Chicago plant, to cost about $1,500,000, which will be capable of producing 18,000 tons of iron monthly. It will replace one of the three furnaces at this plant and give the company three modern type stacks each with a monthly capacity of 18,000 tons.

Pacific Coast Steel Industry Growing

Mills There Now Supply About One-fourth of Total Consumption, Trade Conference at Del Monte, Cal., Is Told by L. F. Rains

INCREASED interest in the development of the steel industry and its allied groups in California and on the Pacific Coast was evidenced by the attendance of more than 200 men in steel and associated industries at the fifth annual conference of the Iron, Steel and Allied Industries of California at Del Monte, Jan. 24, 25 and 26.

Addresses were delivered by L. F. Rains, general manager Columbia Steel Corporation, San Francisco; Ray M. Hudson, assistant director of commercial standards, Department of Commerce; Orra E. Monnette, vice-chairman, Bank of Italy, Los Angeles, and Bennett Chapple, vice-president American Rolling Mill Co., Middletown, Ohio.

Group and committee meetings of representatives of steel mills, foundries, merchant steel dealers, structural steel fabricators, manufacturers and reinforcing steel dealers were held on Jan. 24 and the following subjects were brought up for discussion: Price cutting; anti-trust laws; credit protection on paper finance jobs; establishment of credit interchange as between members of each group; imports.

A special foundry group meeting on Jan. 24 was presided over by Carroll A. Stilson, Metal Trades Manufacturers Association, Los Angeles. Ray M. Hudson, Department of Commerce, spoke on "What the Foundries Have Done to Improve Their Conditions by Adopting Standards and Simplified Practice," and Luther S. Becker, chief iron and steel division, Bureau of Foreign and Domestic Commerce, Washington, talked on "How Foundries Are Affected by the Foreign Steel Situation."

Resolution Against Price Cutting

This group passed the following resolution on price cutting: "That, as prices are based on individual cost, and as it is impossible at present to establish unified cost finding in all foundries, the foundry group go on record as to fixing prices based on cost plus a reasonable profit and maintain same."

A special program for the manufacturers' group was held on Jan. 24. Mr. Hudson and Mr. Becker also addressed this division. Mr. Hudson spoke on the large annual loss due to avoidable waste in industry and on the work the Bureau of Simplified Practice is doing to eliminate it.

F. T. Letchfield, Wells Fargo Bank & Trust Co., San Francisco, addressed the members of this group on taxation, and gave a résumé of tax legislation and its results.

The main session of the conference was held on the morning of Jan. 25. Frederick J. Koster, president California Barrel Co., San Francisco, executive chairman, opened the conference by briefly outlining the results obtained during the past year and urged that all members take a more active part during the coming year. L. F. Rains then spoke on "Manufacture of Iron and Steel in the West."

Pacific Coast's Annual Ingot Capacity Now 600,000 Tons

Mr. Rains stated that the steel industry on the Pacific Coast, which started in 1904 with the formation of the Pacific Coast Steel Co., has rapidly grown to become one of the West's leading industries. He pointed out that in the past there have been several steel developments on the Pacific Coast, but at the present time the two major operations are the Pacific Coast Steel Co. and the Columbia Steel Corporation.

"The present capital invested in these companies," he said, "is approximately $55,000,000, and the present ingot capacity 600,000 net tons a year. Their total gross sales for 1928 amounted to about $30,000,000. The Pacific Coast territory consumed in 1928 between 1,750,000 and 2,000,000 net tons of steel products, about one-fourth of which was supplied by these companies, which manufacture the following commodities: reinforcing bars, merchant bars, structurals, universal plates, sheets, wire and nail products, wire netting, copper rods and wire, steel forgings, nuts and bolts, castings, pig iron, coke, tar, ammonium sulphate, motor benzol and coke oven gas.

"The Pacific Coast is dependent on the Eastern and foreign mills for the larger structurals, plates, pipe, tubing, tin plate, all special steels and quite a number of other commodities."

About 441,000 tons of steel scrap, which is produced on the Pacific Coast, and 85,000 tons of pig iron were used by the two Pacific Coast steel plants last year, he said.

Mr. Rains pointed out that allied trades and business in general in the West benefited by the expansion of the steel industry on the Coast. He said: "These companies during 1928 expended approximately $16,000,000 for materials, electric power, etc."

In concluding, he stated that the Pacific Coast steel industry is on a sound economic basis and that increased consumption and the resultant increased production would help further to reduce costs and improve the general situation.

Ray M. Hudson, Department of Commerce, in his talk on standardization and simplified practice, said: "Over 100 simplifications have been effected to date and some of these include the reduction of sizes of wrought iron pipe from 62 to 49, of steel reinforcing bars from 32 to 11, of metal lath from 125 varieties to 29 and of woven wire fence from 552 to 69 sizes." In speaking of the avenues leading to better profits, he said that possibly the most important is that of continually studying costs.

Orra A. Monnette, Bank of Italy, Los Angeles, stressed the fact that all businesses should strive for better understanding and more intelligent cooperation not only among their direct competitors, but with interests identified only partially with their line of work.

An address on "The New Day in Merchandising," by Bennett Chapple, vice-president American Rolling Mill Co., included the advice to manufacturers in all lines of business to give more thought to publicity and to instilling into the minds of the general public a knowledge of their products.

Charles F. Abbott, executive director American Institute of Steel Construction, New York, addressed an evening session on "Standard Selling Practices," and pointed out the viciousness of price cutting and the disastrous effect it had not only upon the line of industry that had resorted to price cutting, but upon the community as a whole.

Officers and Group Commitee Chairmen Named

E. C. Wilson, Wilson & Willard Mfg. Co., Los Angeles, was unanimously elected chairman to succeed Frederick J. Koster, California Barrel Co., San Francisco, presiding officer during the past two years. E. F. Gohl, McClintic-Marshall Co., Los Angeles, was named vice-chairman for the southern California district, and R. M. Alvord, General Electric Co., San Francisco, vice-chairman for the northern California section.

The following group committee chairmen were named:

Steel mills of southern California: Harvey Hewitt, Southern California Iron & Steel Co., Los Angeles.

Steel mills of northern California: J. D. Fenstermacher, Columbia Steel Corporation, Los Angeles.

Foundries of southern California: Car-

roll A. Stilson, Metal Trades Manufacturers Association, Los Angeles.

Foundries of northern California: C. E. Williams, Columbia Steel Corporation, San Francisco.

Structural steel fabricators of southern California: C. E. Bradburn, Pacific Iron & Steel Co., Los Angeles.

Structural steel fabricators of northern California: C. H. Ramsden, Pacific Coast Engineering Co., Oakland.

Manufacturers of southern California: E. C. Wilson, Wilson & Willard Mfg. Co., Los Angeles.

Manufacturers of northern California: R. M. Alvord, General Electric Co., San Francisco.

Merchant steel dealers of southern California: E. Jungquist, Percival Steel & Supply Co., Los Angeles.

Merchant steel dealers of northern California: George R. Borrmann, George R. Borrmann Steel Co., Oakland.

Traffic men of southern California: T. A. L. Loretz, Consolidated Steel Corporation, Los Angeles.

Traffic men of northern California: W. C. Hubner, A. M. Castle & Co., San Francisco.

Reinforcing steel dealers of southern California: J. Earl Heber, Truscon Steel Co., Los Angeles.

Reinforcing steel dealers of northern California: Charles M. Gunn, Gunn, Carle & Co., San Francisco.

In addition, the following were appointed members of committees, others to be named later:

Merchant steel dealers of southern California: E. Jungquist, Percival Steel & Supply Co., Los Angeles, chairman; Walter Anderson, California Hardware Co., Los Angeles; A. C. Denman, Denman & Grier, Los Angeles; O. E. Bean, Union Hardware Co., Los Angeles; J. E. Webster, Ducommun Corporation, Los Angeles.

Structural steel fabricators of southern California: C. E. Bradburn, Pacific Iron & Steel Co., chairman; C. Fred Brombacher, Brombacher Iron Works, Los Angeles; E. F. Gohl, McClintic-Marshall Co., Los Angeles; R. P. Miller, Consolidated Steel Corporation, Los Angeles; Charles Ham, Modern Iron Works, Los Angeles.

Structural steel fabricators of northern California: C. H. Ramsden, Pacific Coast Engineering Co., chairman; Paul F. Gillespie, Judson-Pacific Co., San Francisco; Charles E. Spencer, California Steel Co., Oakland; S. S. Herrick, Herrick Iron Works, Oakland; Howard Morris, Western Iron Works, San Francisco.

The following recommendations were adopted by the conference:

That the conference reaffirm the principles of business conduct adopted by the United States Chamber of Commerce and bring them more forcibly to the attention of each of the groups for promulgation among their membership.

That it be the sense of this conference that the present program has been productive of much good to the industry and that it be continued more actively, with particular reference to: extension of marketing territory through fair and necessary rate adjustments; the development of markets for domestic payrolls on a basis of service, quality and price; the introduction of further standard grades and practices to lower costs and increase efficiency of production and distribution; the development of a higher standard of business ethics in the industry; greater publicity among the various trade and business groups on the importance and value of the iron and steel industry to the prosperity of California and the Pacific Coast.

That two regional meetings of the Iron, Steel and Allied Industries of California be held during the coming year, the first in Los Angeles in June and the second in San Francisco in October.

That the next annual conference of the Iron, Steel and Allied Industries of California be held at Del Monte, Feb. 13, 14 and 15, 1930.

Educational Film Depicts Heat Treatment of Steel

"The Heat Treatment of Steel" is the subject of the latest addition to the library of educational motion picture films produced by the Department of Commerce for the visualization of the mineral industries of the country. The film was made, under the supervision of the United States Bureau of Mines, in cooperation with one of the large automobile manufacturing companies. It is brought out that some 1475 separate steel parts of a typical automobile must be given special heat treatment, illustrating forcibly the importance of this process in the automotive manufacturing industry.

The old-time methods of tempering steel, with anvil and forge, when the color of the metal alone indicated the degree of tempering, are shown; then in contrast, the various steps in the modern methods of heat treatment. Copies of this film are now available for exhibition by educational institutions, churches, clubs, civic, business and military organizations, and others who may be interested. Applications should be addressed to the Pittsburgh Experiment Station, United States Bureau of Mines, Pittsburgh.

A NOVEL use of rolled steel was made recently in Kansas City, where during the holiday season a community Christmas tree was built with a welded steel mast serving as the tree trunk and to which branches of evergreen were fastened to form the tree. The mast was constructed entirely of angles trussed by flat bars arc welded at their intersections and to the legs of the angle members. The mast was erected by the Kansas City Structural Steel Co., which used Lincoln Stable-arc welders.

Trust Laws Rarely Invoked Against Mergers

Existing Federal anti-trust legislation offers no serious barrier to mergers of business enterprises, says a report on the legal aspects of consolidations by the National Industrial Conference Board, New York. Complaints against interference with the business rights of others and collusive agreements among competitors have played a considerably greater part in actions brought under the anti-trust laws than complaints against consolidations as such, according to an analysis of court cases and decisions. In not more than 10 per cent of the cases in which the penalties of the anti-trust acts have been invoked in the courts have mergers as such been the occasion of the complaint. Moreover the proportion of such cases is declining.

The Conference Board concludes that existing anti-trust legislation, as interpreted and administered by the courts, is neither excessively severe nor repressive. It is pointed out that "the evils which might come from an inflexible and inelastic rule, either of narrow restriction or of broad license, would certainly outweigh any ill effects that may attend the operation of the anti-trust law as now enforced."

More Merchant Vessels Under Construction

Steel ships under construction for mercantile use at the end of the year are reported by Lloyd's Register at 2,617,281 tons gross register. There was a gain as compared with the preceding quarter, but a reduction as compared with a year earlier.

Motor ships accounted for more than half of the total tonnage, at 1,395,148, compared with 1,211,553 for steamers. It is interesting that a 180-ton barge building in France is being constructed of iron instead of steel. Almost half of the total tonnage is being built in the British Isles. The United States accounts for only 47,949 tons, or less than 2 per cent of the aggregate.

New Interests Take Over Alan Wood

W. F. Rust President of Reorganized Company, and Scott Stewart Becomes Chairman of Executive Committee

THE Alan Wood Iron & Steel Co., Widener Building, Philadelphia, has made the following announcement:

"Negotiations started some time ago by H. B. Rust, president of the Koppers Co., and Scott Stewart, president of W. J. Rainey, Inc., resulted in the settlement yesterday (Jan. 31) at the offices of the Fidelity-Philadelphia Trust Co. of the offer of the above-named companies to purchase the common and preferred stocks of the Alan Wood Iron & Steel Co. Stock of a newly organized corporation known as the Alan Wood Co. was exchanged for the preferred and common stocks of the Alan Wood Iron & Steel Co., substantially all of the stock of the latter company being exchanged in the above manner. The new Alan Wood Co. now owns all of the stock of the Rainey-Wood Coke Co. as well as that of the Alan Wood Iron & Steel Co."

W. F. Rust, vice-president of the Koppers Co., who was formerly connected with the Youngstown Sheet & Tube Co., becomes president of the new Alan Wood Co. and Scott Stewart, who for many years has been president of W. J. Rainey, Inc., which has large coal properties and beehive coke ovens, is chairman of the executive committee.

The board of directors of the Alan Wood Co., in addition to W. F. Rust and Mr. Stewart, consists of the following: H. Lee, vice-president of the Koppers Construction Co.; Donald MacArthur, vice-president and general manager Seaboard By-Product Co., who is in charge of the Eastern plants of the Koppers Co.; Hugh F. Smith, counsel for the Koppers Co.; J. T. Tierney, who is in charge of the operating companies of the Koppers Co.; Roy W. Heffner, who for the past 10 years has been general manager of the Rainey-Wood Coke Co.; A. P. Meyer, vice-president and general manager of Davison Coke & Iron Co., Pittsburgh; Howard Wood, Jr., formerly an officer and director of the Alan Wood Iron & Steel Co., who represents the preferred stockholders on the board of the Alan Wood Co.

The executive committee, in addition to Mr. Stewart as chairman, consists of W. F. Rust, H. Lee, Donald MacArthur and Roy W. Heffner.

It is announced that H. C. Thomas, who was president of the Alan Wood Iron & Steel Co., will continue with the new company as vice-president and will have charge of operations. The new interests say that "in general no changes will be made in the present operating organization of the Alan Wood Iron & Steel Co. as a result of its acquisition by the new Alan Wood Co."

Only Minor Changes in Employment Situation

Comparison of employment and payroll totals in identical establishments in various branches of the iron and steel industry has been made by the United States Bureau of Labor Statistics. In December 202 iron and steel plants had 273,810 on the payroll, compared with 274,385 in November. The amount of payroll in one week was $8,679,099 in December and $8,839,102 in November, a reduction of 1.8 per cent and a loss from the average pay envelope of 1.6 per cent.

Increases were shown in 960 establishments making foundry and machine shop products, which had 250,084 employees in December, against 248,243 in November. The payroll advanced from $7,473,084 to $7,647,979, or 2.3 per cent, and the average envelope was 1.6 per cent heavier.

Machine tool plants showed a more substantial increase on the basis of returns from 145 plants. Employment went up from 35,534 to 36,739, or 3.4 per cent, while a week's payroll advanced from $1,190,595 to $1,259,334, or 5.8 per cent.

There were increases in structural iron work establishments and in those making hardware. Decreases were recorded, however, in plants making stoves and in those making steam fittings and steam and hot water heating apparatus. Cast iron pipe establishments showed a reduction of 2.3 per cent in employment, but an increase of 1.8 per cent in payroll total.

Engineering Foundation Sponsors Researches

Dr. John Johnston, director of research and technology, United States Steel Corporation, is chairman of a committee appointed by Engineering Foundation to supervise a comprehensive codification of published information on steel and other alloys of iron. Other members of the committee are F. M. Becket, president Union Carbide & Carbon Research Laboratories, H. W. Gillett, Bureau of Standards, James T. MacKenzie, metallurgist American Cast Iron Pipe Co., and A. J. Wadhams, manager of research and development, International Nickel Co.

Contingent upon securing sufficient funds for a five-year program (estimated to cost $30,000 per year) the committee proposes to appoint a salaried editor and sufficient assistants to survey critically the available literature and republish the information therefrom in orderly arrangement in the form of monographs, and in briefer manuals concerning particular phases of the work. Before these are issued, however, they will be reviewed by advisers or consultants chosen from the industries most interested in that phase. It is hoped in this manner to make available at nominal cost digests of information on particular subjects which would cost an individual firm an almost prohibitive figure, and to save the recurrent cost and duplication of effort needed for examining the literature before embarking upon a major investigation.

It is felt by the committee that makers and users of large quantities of steels will benefit sufficiently from the results of such a survey as to warrant liberal subscriptions. Correspondence is solicited by Engineering Foundation, 29 West Thirty-ninth Street, New York, Alfred D. Flinn, director.

Mechanical Engineers to Meet at Knoxville

The American Society of Mechanical Engineers will hold a meeting at Knoxville, Tenn., March 21, 22 and 23 at which a program of papers is scheduled to cover in part recent advances in engineering practice in the South. Among the papers scheduled are the following:

Factors in the Design of Boiler Furnaces, F. C. Stewart, assistant professor experimental engineering, Georgia School of Technology, Atlanta.

Analysis of the Surveys of the Tennessee and Its Tributaries, J. A. Switzer, professor hydraulics and hydraulic engineering, University of Tennessee.

New Departures in the Drawing of Thin Seamless Tubing, W. M. Fulton, president Fulton Sylphon Co., Knoxville, Tenn.

The inspection trips include one to the Aluminum Co. of America at Alcoa, another to the American Zinc Co. at Mascot, and a motor trip to Kingsport, Tenn., to observe industrial developments of the Southern Appalachians.

Large Exports of Scrap From Houston, Tex.

Exports of scrap from Houston, Tex., continue to grow in volume, material being drawn principally from Texas and Oklahoma points. Japan has been taking old material for some time from this Southern port, and now Italy has become a customer.

The Swedish steamer Georgii recently sailed from Houston with 5000 tons of old material for Genoa, and a second cargo for the same port will be loaded some time this week on the steamer Collingsworth of the Texas-Oceanic Steamship Co. The steamer Egefield of the Tampa-Oceanic Steamship Co. has sailed from Houston with 3000 tons for Japan.

Steel Used in River Barges Declines

Consumption in 1928 Was About 10,000 Tons Less Than in 1927, Though 23 More Hulls Were Launched

RIVER craft launchings in 1928 by builders whose principal outlet is for barges, towboats, etc., for service on the Mississippi and Ohio rivers and their tributaries were more numerous than they were in 1927 by 23 units, but the amount of steel required in their construction was almost 10,000 tons under the tonnage that went into the 1927 vessels. In 1928 the launchings numbered 529 hulls, the construction of which required 62,443 net tons of rolled steel in an approximate ratio of 70 per cent plates and 30 per cent structural shapes, compared with 506 hulls, taking 72,057 net tons in 1927. Stated in gross registered tonnage, the 1928 launchings were approximately 155,000 tons, compared with almost 180,000 tons for the year before.

These data are the result of the annual canvass by THE IRON AGE of builders, and are based upon reports from the following companies: Alabama Dry Dock & Shipbuilding Co., Mobile, Ala.; American Bridge Co., Pittsburgh; Dravo Contracting Co., Pittsburgh; Howard Ship Yards & Dock Co., Jeffersonville, Ind.; Jones & Laughlin Steel Corporation, Pittsburgh; Marietta Mfg. Co., Point Pleasant, W. Va.; Midland Barge Co., Midland, Pa.; Nashville Bridge Co., Nashville, Tenn.; Riter-Conley Co., Pittsburgh, and the Charles Ward Engineering Works, Charleston, W. Va. The same companies reported in the 1927 canvass.

Decrease last year in the amount of steel used in the face of the increase in the number of hulls launched is explained by a preponderance of small, light-weight barges in last year's construction. Hulls taking less than 100 tons each were much more numerous last year than in 1927. Except for five combination river and sea-going barges, taking 1250 tons, the figures refer exclusively to craft intended for inland waterways service. Last year was the first year since this annual canvass was started four years ago in which a decrease in the use of steel has been registered. Launchings in 1925 took 53,710 tons, while those for 1926 required 63,776 tons. River craft lettings since the first of this year, however, have made a more favorable showing than for the same period last year and stimulation of the use of the rivers and consequently in the purchase of barges, towboats, etc., is expected to result from the completion of the canalization this year of the Ohio River from Pittsburgh to its junction with the Mississippi at Cairo, Ill.

To Distribute Krupp Tool Steel and Widia Metal

The Essen Steel Co., 1708 Keenan Building, Pittsburgh, recently organized, will be the distributer in the United States of Krupp tool steel imported through Thomas Prosser & Son, 15 Gold Street, New York. It will also distribute Krupp Widia metal, a tungsten carbide-cobalt combination for cutting tools, in western Pennsylvania for the Prosser company. Paul F. Hermann is president of the Essen Steel Co.; Hugo Schick, vice-president; E. A. Giessen, secretary-treasurer, and F. E. Faustman, assistant secretary-treasurer.

Heavy Production of Electric Power in December

Production of electric power by public utility power plants in the United States is reported for December by the Geological Survey at 7870 millions of kwhr. This is an increase of 1½ per cent over the 7750 of November but is almost 1 per cent under the 7922 of October, which was the greatest total ever recorded. These three months represent higher totals and higher daily averages than in any preceding months.

A smaller proportion of the total was made by water-power in December than in either November or October. The total of 2755 in December was 35 per cent of the aggregate production, compared with 36 per cent in November and 36.3 per cent in October.

Money Rates Expected to Restrict Building

The level of money rates is the chief uncertainty in the business outlook, particularly as it affects construction, according to the second monthly statement of the Conference of Statisticians in Industry, which operates under the auspices and with the cooperation of the National Industrial Conference Board, New York.

The high level of financial activity, with sustained activity in a few industries, contrasted sharply with a low rate of general business expansion in 1928. No marked change for better or worse is indicated by available statistical and other reports for December and January.

Last year was a period of less than normal growth in general business, being notable only for a few months of high activity in iron and steel, in automobiles and related industries, and in building construction.

Building contracts in December declined for the third successive month and were 9 per cent below December, 1927. Residential building has been declining since the summer of 1925, and in December such contracts were the lowest since February, 1925.

Chicago, Green Bay, Wis., Rate Hearing Held

Testimony to substantiate the complaint made by Green Bay, Wis., jobbers and manufacturers that the rates on iron and steel from the Chicago switching district to Green Bay are unreasonable and unduly prejudicial has been presented before Examiner Maidens of the Interstate Commerce Commission. The rate from Chicago to Green Bay is 20½c., which, as established by a previous ruling, is 90 per cent of the fifth class rate. The present rate from Chicago to Milwaukee is 9½c., having been increased from 8½c. as the result of the Jones & Laughlin rate decision.

The Green Bay witnesses objected to the spread of 11c. as between Milwaukee and Green Bay on shipments from Chicago, and they have asked the carriers for reparations in the amount of $30,000.

Manufacturers in Milwaukee, Racine and Kenosha, Wis., have investigated the possibilities of transporting iron and steel from the Chicago district by boat, and they threaten to make use of this means of transportation if there is an increase in the 9½c. railroad rate on these articles from Chicago.

E. G. Hetherington, traffic manager A. O. Smith Corporation, Milwaukee, stated that his company used 285,924 tons of steel in 1928, and if there is any attempt to disturb the present rate his company will make use of water transportation, even if it necessitates the establishment of its own boat or barge line. He estimated the needs of the company for 1929 at 325,000 tons.

Representatives for other Milwaukee concerns disclosed the following iron and steel requirements of their companies: The Allis-Chalmers Co., 7980 tons; Milwaukee Corrugating Co., 40,000 to 50,000 tons; Worden-Allen Co., 17,000 tons; Lakeside Bridge & Steel Co., 11,000 tons. Witnesses representing Kenosha and Racine joined in this testimony, speaking for firms which annually use 70,000 tons of iron and steel.

The carriers, when they present their testimony, will show that the density of traffic and the potential water competition between Chicago and Milwaukee warrant a correspondingly lower rate between these two points than from Chicago to Green Bay.

The American Mining Congress has announced that its manufacturers division will hold its sixth annual convention of practical coal operating men and national exposition of coal mine equipment at Cincinnati, May 13-17.

Foundrymen's Tentative Program

Nearly 30 Technical Papers and Reports With Round-Table Luncheons and Symposiums Arranged

THE program committee of the American Foundrymen's Association has announced its schedule of papers for the thirty-third annual convention in Chicago at the Stevens Hotel, April 8 to 11. Special effort has been made to provide sessions of particular interest to the foundry executives, while others will appeal to the engineer and metallurgist. Still others have been arranged for the shop man in the form of shop operation courses as well as round table meetings on fundamentals of shop practice. For the executive there will be papers and discussions on foundry cost methods, foreman training, general management and apprentice training. The technical meetings are tentatively as follows:

FOUNDRY COSTS:
- "Practical Aspects of the Value of Foundry Cost Methods," by E. T. Runge, Cleveland.

STEEL FOUNDING:
- "Alloy Cast Steels," by D. Zuege, Sivyer Steel Casting Co., Milwaukee.
- "Efficient Steel Casting Grinding," by F. A. Lorenz, Jr., American Steel Foundries, East Chicago, Ind.
- "Report of Investigation of Effects of Phosphorus and Sulphur in Steel," by R. A. Bull, Electric Steel Founders Research Group, Chicago.
- "Report of Committee on Steel Castings."

CAST IRON METALLURGY:
- "Quality of Pig Iron and Cast Iron as Affected by Blast Furnace Practice," by A. L. Boegehold, General Motors Corporation, Detroit.

GENERAL FOUNDRY MANAGEMENT AND PRACTICE:
- "Use of Scrap in Gray Iron, Malleable, and Electric Steel Mixtures," by E. K. Smith and F. B. Riggan, Stockham Pipe & Fittings Co., Birmingham, Ala.
- "Safety and Sanitation in the Foundry," by F. H. Elam, American Steel Foundries, Chicago.

SAND CONTROL—PRACTICE AND RESEARCH DEVELOPMENTS:
- "Review of Sand Handling Installation Problems."
- "The Refractoriness of Foundry Sands," by J. F. McMahon, Mines Branch, Department of Mines, Ottawa.
- "Report of Committee on Molding Sand Research."

NON-FERROUS FOUNDRY PRACTICE:
- "Some Practical Problems in the Brass Foundry," by H. J. Roast, National Bronze Co., Ltd., Montreal.
- "An Open-Flame Hearth-Type Furnace for Melting Aluminum and Its Alloys," by R. J. Anderson, G. E. Hughes, and M. B. Anderson, Fairmont Mfg. Co., Fairmont, W. Va.
- "Electric Arc Furnaces in General Jobbing Brass Foundry," by J. B. Meier, F. & H. Foundry Co., Newark, N. J.
- "Report of Chairman of Division of Non-Ferrous Foundry Practice."

IRON FOUNDING PRACTICE:
- "A Study of 36-In. Cupola Operation," by F. B. Coyle, International Nickel Co., New York.
- "Some Problems of Cupola Operation," by G. S. Evans, Mathieson Alkali Works, New York.
- "Investigation of Causes of Defective Castings for Enameling Ware," by C. J. Scullin, Tucker-Scullin, Inc., St. Louis.
- "Report of Chairman of Division of Gray Iron Foundry Practice."

MATERIALS HANDLING:
- "Mold Handling," by R. J. Heisserman, Link-Belt Co., Philadelphia.
- "Materials Handling in the Foundry," by A. Walton, Philadelphia.

FOREMAN TRAINING—A symposium led by men prominent in the foreman training movement.

MALLEABLE IRON FOUNDRY PRACTICE:
- "Controlling the Atmosphere in Malleable Annealing Ovens," by W. F. Graham, Ohio Brass Co., Mansfield, Ohio.
- "Practical Aspects of White Fracture Malleable Iron," by Duncan Forbes, Rockford-Northwestern Malleable Corporation, Rockford, Ill.
- "Report of Representative on Committee Advisory to Bureau of Standards," by J. B. Deisher, Rochester, N. Y.
- "Report of Chairman of Division of Malleable Iron Foundry Practice."

APPRENTICE TRAINING:
- "Report of Committee on Training of Apprentices."
- "Why We Train Apprentices," by J. A. Davies, Westinghouse Electric & Mfg. Co., Philadelphia.
- "How We Train Apprentices," by A. M. Cornell, Pettibone-Mulliken Co., Chicago.

HIGH-TEST CAST IRON:

European Developments:
- Dr. E. E. Marbaker, Mellon Institute, Pittsburgh.
- Dr. Fritz Meyer, National Radiator Co., Johnstown, Pa.

American Developments:
- F. B. Coyle, International Nickel Co., New York.
- R. S. McCaffery, Department of Metallurgy, University of Wisconsin, Madison, Wis.
- R. S MacPherran, Allis-Chalmers Mfg. Co., Milwaukee.
- H. Bornstein, Deere & Co., Moline, Ill.

The shop operation courses on steel foundry and gray iron foundry practice are scheduled for 4 p. m. each day of the convention. The subject for the first session on the steel foundry is "Pouring Practice;" for the third session, "Core-Room Practice," and for the fourth session, "Heat Treatment of Steel Castings." "Cupola Control" is the topic for the first session on gray iron foundry practice, with "Sand Control Fundamentals" for the combined session on steel and gray iron foundry practice at the second session; "Gates and Risers" for the third session on gray iron foundry practice and "Cupola Control—melting operations" for the fourth session.

On Tuesday, April 9, there will be two round table luncheons and meetings—one on uniform non-ferrous cost methods and one on steel foundry practice. The round table luncheon and meeting on malleable iron foundry practice will be held Thursday, April 11. A dinner meeting for those interested in sand control is to be held at 6 p. m., April 9. A symposium on foreman training is the only session scheduled for the afternoon of April 10.

Pullman to Build Car Plant in Alabama

The Pullman Car & Mfg. Corporation, Chicago, has awarded a contract to the United Engineers & Constructors, Inc., Philadelphia, for the construction of a new car manufacturing plant at Bessemer, Ala., to occupy the site of the Nos. 1 and 2 blast furnaces of the Tennessee Coal, Iron & Railroad Co., which are now being dismantled. The Pullman company purchased the Fairfield car plant of the Tennessee company some time ago and equipment from this plant is to be moved to Bessemer following the completion of the new plant.

General Bronze Co. Builds Plant Addition

The General Bronze Co., 3212 Smallman Street, Pittsburgh, is making another extension to its plant, the second since its organization in August, 1927. The company's original plant, completed and occupied in April, 1928, was recently supplemented by the purchase of a nearby two-story fireproof building and the company has placed the contract for a new building which will connect the two and house the core making department and furnaces. With the completion of the latest addition, the company will rank high in foundry and machine shop capacity among the non-ferrous metal plants of the Pittsburgh district, and will be able to produce bronze or copper castings from one ounce to 10 tons in weight. Officers of the company are M. Murray, chairman; C. S. Rush, president; E. J. Averman, vice-president and treasurer, and J. F. McNaul, secretary.

Compares German Motor Center with Detroit

Paul Pleiss, foreign director of the Edward G. Budd Mfg. Co., Philadelphia, and the Budd Wheel Co. in Europe, is visiting the Budd company in Philadelphia until Feb. 16, when he returns to Europe.

Mr. Pleiss, who is familiar with automotive developments in Europe, points out that Germany is the great future market for automobiles and that Johannestahl, near Berlin, is the European automobile manufacturing prototype of Detroit. Already there are concentrated there, in one manufacturing community, an imposing list of German automotive enterprises and the plants of American manufacturers serving the European market, including Chrysler, Graham-Paige and Willys-Overland.

Boston Steel Treaters Hold Meeting on Springs

The February meeting of the Boston chapter of the American Society for Steel Treating, held Friday evening, Feb. 1, at the Massachusetts Institute of Technology, was its ninth anniversary meeting. Dr. G. B. Waterhouse, chairman of the program committee, introduced Raymond W. Cook, factory manager Wallace Barnes Co., Bristol, Conn., who said that his company produced last year approximately 750,000,000 springs of 50,000 varieties.

Spring manufacturing he put into three divisions, design, mechanical manufacturing and heat treating. The effect of heat treating on the strength and capacity of springs was discussed, then engineering design, including fatigue properties of the steel, the matter of tolerance and rolling and drawing conditions. Mr. Cook presented a wide variety of lantern illustrations showing processes of manufacture at the Bristol plant.

Previous to Mr. Cook's address it was announced that the Massachusetts Institute of Technology, during the summer school, is to have a two weeks' course in physical testing of materials, beginning July 8.

Blast Furnace and Coke Oven Meeting Program

The midwinter meeting of the Eastern States Blast Furnace and Coke Oven Association, to be held at the William Penn Hotel, Pittsburgh, Friday, Feb. 15, includes separate sessions in the morning, starting at 10 o'clock, for the discussion of blast furnace and coke oven topics; a joint session in the afternoon, and a paper, "The Fuels of the Future," following dinner in the evening, by M. R. Campbell, principal geologist, Department of the Interior, Washington.

Topics listed for discussion at the blast furnace meeting, at which L. E. Riddle, general superintendent, City Furnaces, Carnegie Steel Co., Pittsburgh, will preside, are:

Effect of 24-ft. hearth diameter on the quality of pig iron and furnace economy and practice.

Results obtained by changing annular space between large bell and furnace lining.

Advisability of using cooling plates above the mantel.

Review of any tests made on sintered ores.

Discussion of latest developments on gas cleaning.

Latest hot blast stove construction.

Sintering of fines from dry cleaners.

Effect on blast furnaces by use of nut or domestic coke.

A. H. Harris, Jr., superintendent of coke ovens, Lackawanna plant, Bethlehem Steel Co., Lackawanna, N. Y., will preside at the coke oven meeting, at which the following subjects will be discussed:

Progress of phenol situation.

Is the present trend toward wider ovens?

Production costs and sales prices of ammonia.

Methods of cleaning benzol scrubbers, types of grids, etc.

Flexibility of by-product production.

Type of pulverizing equipment best adapted for the production of uniform size of coal.

R. J. Wysor, general manager Jones & Laughlin Steel Corporation, Pittsburgh, is chairman of the afternoon joint session, for which the program includes:

Effect of coke made from stock coal on blast furnace practice.

Use of blast furnace gas under coke ovens.

Principal factors involved in production of flue dust.

Cleaning blast furnace gas for use in coke ovens and steel mill furnaces.

Is the use of 100 per cent low volatile coal in making coke for blast furnaces justified in the Pittsburgh district?

Pittsburgh Welding Section at Westinghouse Plant

Besides being able to view the arc-welded structures of the new insulator buildings of the Westinghouse Electric & Mfg. Co. at North Trafford, Pa., members of the Pittsburgh section of the American Welding Society on Jan. 30 had the opportunity to discuss the detailing of structural steel at the Westinghouse auditorium, East Pittsburgh. More than 50 men interested in structural steel construction and in welding attended.

E. C. Brown, consulting engineer, Pittsburgh, who did the detailing of the welded structural steel, described the insulator plant as the second largest structure of welded type in the United States. A second paper, written by G. F. Emery, chief city building inspector, Detroit, and read by George H. Danforth, secretary of the Pittsburgh section, detailed a code which had been formulated for welded steel structures in that city.

Harvard to Hold Business Men's Session Again

The Harvard Graduate School of Business Administration, Cambridge, Mass., will hold its second special session for business executives July 1 to Aug. 2. Seven courses will be offered, namely Interpretation of Financial Statements, Public Utility Management and Economics, Railroad Transportation, Bank Management, Sales Management, Retail Distribution and Trust Management. Classes will be limited to not more than 50 men and will be held for four hours each day.

Last year 172 business men and eight teachers of business subjects enrolled in the five courses offered. They represented 95 companies and 26 States. In commenting upon the session, W. B. Donham, dean of the school, stated that "economic material and data in the form of cases, problems and similar material from many business concerns have been collected for the last 10 years." This material, classified and organized so that it may be used to indicate many of the fundamental economic principles underlying business, serves as the basis for class work.

British Ceramic Society to Visit United States

A visit to the United States is being arranged for the Ceramic Society of Great Britain. According to the London *Iron and Coal Trades Review*, the secretary of the society states that the party will leave Southampton on the Laconia on April 20, this year, arriving at New York on April 29. The return from New York is scheduled for May 18 on the Scythia, arriving at Liverpool May 27. For those who wish to visit and extend the trip to Canada, the steamship Andania of the same line leaves Montreal on May 24 and arrives at Liverpool about June 4. Arrangements can also be made for those who wish to return at a still later date. The party will be divided into three groups: Pottery tiles and white ware generally; refractories, and building bricks and heavy clay wares.

Manufacturing Slightly Less Active in December

Activity in the primary manufacturing industries in the United States in December, as measured by the consumption of electrical energy, is reported by *Electrical World* to have been somewhat less than in any of the three immediately preceding months. The December index is given as 127.3, compared with about 134.5 in November. With the exception of last February, as also September, October and November, the December total was the largest for any month in four years.

The index for the metal industries was about 139, which had been exceeded in the four years only by the immediately preceding months. The automobile industry showed a December index of about 130, which was considerably less than during most of the year. Other leading industries show varying conditions. The indices are based upon the average monthly manufacturing activity of 1923 to 1925 as 100.

The American Bridge Co. has permanently closed one of its Chicago fabricating shops which is known as the Lassig plant. Machinery has been removed and the site and buildings are offered for sale or lease. This plant was built in 1885 and was operated under the name of the Lassig Bridge & Iron Works until 1900, when it was acquired by the American Bridge Co. It had a capacity of 2500 tons per month.

This Issue in Brief

Trouble ahead for buyers of articles with flash plates of chromium, says plating specialist. Most chromium-plated articles now on the market would show signs of rust, he says, in less than 15 hr. exposure to salt spray test. Flash coatings are valueless, and invite trouble.—Page 405.

* * *

Progressive assembly methods used in aircraft factory. In all-metal airplane plant, main assembly line, in center of building, is fed from each side by important sub-assemblies.—Page 401.

* * *

Butt weld is strongest and cheapest weld for full-sized pipe, acetylene manufacturer finds. Full strength of pipe wall is developed by plain butt weld.—Page 407.

* * *

Fear of unrestrained competition gives birth to trade agreements and cartels. But agreements melt like August snow when prices rise. The law of supply and demand is stronger than producers' agreements in controlling the market for commodity prices.—Page 426.

* * *

Doubles malleable foundry's output of molten metal without increasing size of furnace. Iron is melted in cupola and discharged into air furnace for refining. Duplexing has cut costs and improved physical properties of castings.—Page 398.

* * *

Chromium plate on automobile body stock should be at least 0.0005 in. thick, to protect it from atmospheric corrosion, says plating specialist. But he finds the practice is to give a flash coat of about 0.00001-in. thickness.—Page 406.

* * *

Foundry removes slag from molten iron by passing it under steam jet. Slag is thus forced back and passed off in a side trough.—Page 398.

Forges boiler drum from 165-ton ingot. A 24-in. hole is bored through axis of ingot, and the hole is expanded, forming a rough tube of 4 ft. i. d. and 7 ft. o. d., which is then rough-forged under an 8000-ton press, and finish-forged under a 4000-ton press.—Page 406.

* * *

New steel tie hailed as giving steel key to a new and important market. English railroad orders 70,000 Sandberg steel ties, which is a ribbed bar with edges and ends turned down. In cost it compares favorably with wooden ties.—Page 408.

* * *

Big scrap producers are selling direct to steel mills. Tendency to eliminate the middleman is growing, as mills desire to obtain a portion of their scrap from sources offering uniform grade and quality.—Page 411.

* * *

Price maintenance favored by manufacturers. Federal Trade Commission's investigation reveals that 72.7 per cent of manufacturers who made acceptable returns voted for legalization of price maintenance.—Page 418.

* * *

Unusual hardening and tempering process employed in making high-grade tensile steel strip into tubing for dirigible construction. Formed tube, under slight tension, is pulled through two dies fixed at either end of electric furnace, which is mounted on 70-ft. draw bench. The die at discharge end of furnace is water-cooled, completing the quenching and hardening process.—Page 400.

* * *

Mergers benefit the consumers more than they do investors and promoters, economist finds. Prices in independent industries have increased 96 per cent since 1900, against only 48 per cent in industries that have consolidated.—Page 426.

Cupola can be closed down and melting stopped and started again without dropping the bottom. This is accomplished by manipulating the blasts. Upper and lower tuyeres of cupola are used alternately to change the melting zone and bring about proper slagging conditions.—Page 398.

* * *

Scrap consumption is growing at rate of more than a half million tons a year. If trend continues at the present astonishing rate, new sources or new methods of recovery may have to be discovered.—Page 412.

* * *

Finishing department is the plant "orphan," says plating specialist. That this department is rarely as efficient as the fabricating departments he lays to the fact that management and production heads are or have been either mechanical engineers or skilled mechanics. But a change is taking place and the "orphan" is coming into its own.—Page 405.

* * *

Prevents damage to presses by providing a work-limit diagram on each press. The diagram shows the limit in size of blank which can be punched safely. The curve permits increased diameter as the thickness of stock decreases.—Page 414.

* * *

New high record established in machinery exports. Almost a half billion dollars' worth of American machinery was shipped to foreign buyers in 1928. Gain over the previous record year, 1920, was 7½ per cent.—Page 459.

* * *

Pig iron makes a new record for January: Daily output of 111,044 tons was largest in history for first month; gain of 2.15 per cent over December. On Feb. 1, there were 202 furnaces in blast, a gain of one during the month.—Page 430.

A. I. FINDLEY
Editor

THE IRON AGE

W. W. MACON
Managing Editor

ESTABLISHED 1855

Mergers and Personnel

ONE of the features of recent industrial history has been the trend toward consolidations. Some mergers have doubtless brought together companies that were naturally complementary; others have been the creation of financial interests which have profited in promotional fees by taking advantage of the investing public's faith in consolidation as a key to cost reduction and market control.

That such faith is frequently unwarranted is the view expressed by Virgil Jordan, chief economist National Industrial Conference Board, in a recent address before the Northeastern Retail Lumberman's Association. Mergers, in his opinion, have not proved, and are not likely to be, a cure-all for excess capacity, overproduction or cut-throat competition, or a royal road to exceptional profits. He presented statistics showing that prices in independent industries have increased 96 per cent since 1900 as against only 48 per cent in industries that have consolidated. The chief beneficiary of mergers, instead of being the investor or the promoter, he said, has been the consumer.

The Conference Board economist is not alone in his skepticism regarding the merits of consolidations. Even in the steel industry (which has seen some of the largest mergers and is commonly regarded as a proper field for consolidation because its products lend themselves to mass output), similar views may be found. A leading executive, who prefers to remain anonymous, sees justification for mergers when they bring about a pooling of patents, but not when such protection is lacking. In his opinion, a well managed steel company of moderate size, without excessive overhead, can compete on even terms with the largest producers.

As one who has had to deal face to face with the problems of directing a large organization, he recognizes that the mere throwing together of properties does not produce an effective business unit. Corporations are essentially armies of men, not aggregations of brick, mortar and machinery. It usually takes three to four years to reorganize the personnel of merged companies, he declares, and twice as long to obtain as efficient operations as the component parts had before consolidating.

AGAIN it is duplexing. This time it is an application to a malleable iron foundry, as described on page 397 of this issue. The incident revives memories of the excited interest among metallurgists only a few years ago when THE IRON AGE told of the announcement by a Cincinnati metallurgist of successful duplexing in a gray-iron foundry. In that case an electric furnace was used to superheat and, to some extent, refine cupola metal, so that a superior product for valves and fittings was obtained. Today the process, as a means to improve gray-iron castings, is a familiar one. More metal in less time was not, however, the chief claim emphasized, as in the present case. By finishing hot cupola metal in an air furnace, the melting time, it appears, is reduced nearly 50 per cent. As an instance of increasing output without sacrifice of quality, the malleable foundry case is exemplary.

Rule of Reason in Industry

RATIONALIZATION in industry, a descriptive term recently coined in Great Britain, is growing much in vogue among ourselves owing to its excellence. It means industrial cooperation for common good and with common sense.

Some critics and objectors have feared that this new theory, however it be described, will eventually supersede the law of supply and demand in controlling the market for commodity prices. There is about as much ground for such a fear as there was during the war for the talk of abolishing the law of supply and demand by Congressional resolution.

Rationalization in industry simply means adjusted operation of the law of supply and demand, just as the program of flood control means adjustment of the flow of the Mississippi River.

Just because petroleum exists abundantly in nature and is relatively easy to get does not mean that a flood of it should be pumped out, with the natural results of extravagant consumption on the one hand and extinguishment of return on the capital invested in production on the other hand.

Nor does an overbuilding of woolen mills mean that every one of them should be operated at maximum capacity, with such a cutting of prices in order to dispose of their product that the investment of capital in them becomes worthless, although many thoughtless persons seem to desire such a condition of industrial operation.

If very low prices be thus enjoyed, of course the outcome is always the same. If capital investment be stripped of profit the adventure of new capital ceases in such an industry. Eventually the old plant wears out, a deficiency of productive capacity follows, and then an era of high prices. Many persons who do not think much, and some with axes to grind, translate the law of supply and demand into meaning low prices

always and in that way; but oppositely it may just as well mean high prices in the same way.

Rationalization means industrial cooperation for the tempering of fluctuations and the preservation of some return on capital investment, which indeed there must be in order to temper fluctuations. The law of supply and demand continues to operate as immutably as flows the Mississippi River. Not even is the existence of an industrial monopoly immune from that economic law. Even a monopoly wants to sell its product and generally as much of it as is possible, and is humbly dependent upon what buyers will give for it. In general in everything it is the buyer who makes the price, as any producer who negotiates with chain stores and mail order houses will testify.

Cartels and conventions are formed not for extortion, but out of fear; fear that unrestrained competition will jeopardize capital. Let prices rise but a little and agreements melt like snow balls at 60 degrees Fahrenheit, for every producer wants to sell more and more of his product. It is about as sensible to think that rationalization in industry, or cooperation, or intelligence, will or can supersede the law of supply and demand as to believe that a man-made decree could rescind gravitation, the survival of the fittest, the indestructibility of matter or any other law of nature.

Tax-Gatherer and Tax-Payer

REIMBURSEMENT of income taxes improperly collected has started a fury in the United States Senate. Some senators have expressed the belief that Mr. Mellon, without conscience, has been gratuitously bestowing public funds upon the United States Steel Corporation, and others. Of course any one with more than kindergarten experience knows that the Federal tax-gatherer gets every cent he can and keeps it if he can. The old economic and political principle that the tax-payer is entitled to the benefit of any doubt is baldly reversed in modern practice. Consequently if the Bureau of Internal Revenue surrenders anything there is a positive inference that it found its position untenable and was constrained to return to the tax-payer what was his own. Even so, without any doubt the tax-gatherer keeps ahead of the game.

However, many grave senators have been strongly perturbed. In the debates on the subject there occurred to one of them the really brilliant idea that the income tax law might and ought to be revised so that there would not be any questions of doubt. Many men of science and of commercial affairs have been saying that for a long time. They would also say that in trying to do such a job the members of Congress would have to keep their hands off. The existing troubles reflect what they do when they essay to draft income tax laws. By all means let there be a clarification of the present income tax law, though we feel sure it would be a money loser from the tax-gatherer's standpoint, assuming of course that there were no increase of rates.

LESS and less rapid is the expansion of the world's need for pig iron. As shown in THE IRON AGE of Jan. 3, the 1913 world pig iron output exceeded that of steel by about 4 per cent. By 1924, however, the world's steel production had grown until it was over 15 per cent greater in tonnage than the pig iron, and in 1928 it was 24.8 per cent in excess. Last year only four countries out of 21 made more pig iron than steel; in 1913 six countries out of 14 made more iron than steel, while in 1924, it was seven out of 21.

Hard Nuts That Have Been Cracked

TEN or fifteen years ago, when news came filtering out that certain complex and expensive alloys of iron had been discovered having unusual resistance to chemical attack or oxidation at high temperature, little interest was shown. The chemical industry had been so busy making explosive and poisonous gases that it had no time to experiment with new materials, and after the war it was so depressed with "that morning after" reaction that it had all it could do to adjust its existing plant and personnel to new business conditions. Besides, it felt it had fairly satisfactory building materials:

Lead for sulphuric acid, tile for nitric, wood or glass for even more corrosive materials, copper, aluminum, tin, and enameled iron for foodstuffs and weak organic acids. Chemical engineers also knew the excellences and limitations of bronzes, and ordinary boiler plate and cast iron.

With perhaps the exception of the 14 per cent silicon cast irons exploited under various trade names, there was no high-alloy iron or steel used for its corrosion resistance by the chemical industry, and little likelihood that the latter would soon be interested in replacing the tried and true materials with more expensive compositions.

Consequently, some years passed before consumers really appreciated the meaning of Brearley's 1913 discovery that heat treated 13 per cent chromium steels would not tarnish in air and weak organic acids, Becket's 1915 findings that 20 per cent chromium low-carbon steels resist scaling in furnace atmospheres, Strauss's work in Germany in 1917 resulting in austenitic steels with 18 per cent chromium and 8 per cent nickel even more resistant to high-temperature oxidation, and the simultaneous and independent work by Johnson in America developing "rezistal," compounds containing perhaps 15 per cent each of nickel and chromium reinforced by the acid and heat-resistant properties of a less amount of silicon. Armstrong's finding that 3 per cent silicon was enough to make a red hot 8 per cent chromium steel almost scale-proof in gas engine exhaust was more rapidly utilized by the motor car builders.

But gradually Mrs. Housewife discovered that stainless steel cutlery required no polishing. Constructors of automatic heat-treating furnaces required scale-proof metals. A rejuvenated chemical industry, turning its attention to synthetic nitric acid, new solvents, cellulose products and gasoline cracking, needed durable and reliable metals for handling materials in quantity at high temperatures and pressures. Gas engines, steam turbines, super-power steam plants all had individual problems to be solved by metal which would not warp, or scale, or get brittle in difficult situations. Food industries—meat packers, dairymen, canneries, even restaurants and home kitchens—dis-

covered that the new tarnish-proof sheet metals make wonderful containers and utensils.

During the past five years has come from these various consumers an increasing demand for these special products, most of them discovered several years ahead of their time. From this circumstance several morals might be drawn. One might call attention to the importance of fundamental research. Another might restate the case for adequate sales promotion and development of new markets. A third, which we wish to stress, is the rapidity with which the metal-making and the metal-fabricating industries have been able to produce special equipment for the most diverse requirements.

If, 15 years ago, a chemist had aspired to make a nitric acid still of metal, his sanity probably would have been suspected. Today he can order one which will corrode no faster than 0.02 in. per year, and get it delivered, riveted or welded to special design from plates as big as 8 by 40 ft. and equipped with seamless tubing. While naturally no one alloy or series of alloys is able to fulfill every combination of heat resistance, chemical attack, workability, weldability, toughness, fatigue and strength at high temperature, a wide variety of conditions has, in fact, so far been met.

British, American and German investigators, the makers of special steels and ferroalloys, the mills, fabricators and heat treaters are to be congratulated upon this situation. It is a real achievement. And the end is not yet. The entire field of iron-carbon-chromium-nickel-silicon alloys, with additions as required of tungsten, molybdenum, cobalt, manganese or aluminum, is so big that its surface has barely been scratched. Enough is known of its possibilities that the specialist in high-alloy steels is like the barnstorming athlete—ready to meet all comers. Bring on your hard nuts to crack!

Uplifting the Scrap Business

ONE of the primary objects of the newly formed Institute of Scrap Iron and Steel is quite frankly admitted to be the uplifting of the scrap iron and steel industry. The scrap trade, it appears, does not conceal the fact that it is not in quite such good repute among its customers as it would like to be. This may be the fault of the few rather than of the many, but the situation being as it is, the members of the industry are going to see what may be done.

Previous attempts to organize the scrap trade have not been wholly successful, but the new movement has made substantial progress in the five months since Benjamin Schwartz became its director general; it has about 250 members of a potential membership of about 350, its dues are said to be ample to cover the costs of the work and the membership seems to be in deadly earnest.

The importance of the industry is attested by the fact that its annual turnover runs into many millions of dollars. Some of its large units have become highly prosperous. What it aims for now is to cast off the opprobrium which has for so long been attached to the business. Even the word "junk" is to become obsolete, if the institute has its way.

Leaders of the association movement are telling the members that before they can go to the steel mills and other buyers of scrap for redress of grievances they must put their own house in order. The word is being passed down the line that unfair dealings will not be tolerated and that disciplinary measures will be resorted to for violations of ethical business principles.

The machinery for this form of self-government will be organized soon through the adoption of a code of business practice, with the Federal Trade Commission as an intermediary. When this has been accomplished the institute will act upon complaints from buyers and sellers of scrap. The institute has made a good beginning in the amicable settlement of disputes within its own ranks by the adoption of a voluntary form of arbitration, and a proposal to accept compulsory arbitration will come before the annual meeting in March, having already received the unanimous endorsement of some of the local chapters.

Once having organized its internal affairs along the new lines, the scrap industry purposes to go to scrap consumers for support and cooperation to put scrap trading on the high plane that the sponsors of the movement hope for. It goes without saying that the scrap buyers of the country will welcome an effort which promises so much, and it is fair to assume that they will listen readily to proposals which will abolish practices that have not been good for either buyer or seller.

Pig Iron From Purple Ore in Italy

Considerable quantities of "purple ore" or "blue billy" are available in Italy for the manufacture of pig iron. Some interesting information on the use of this purple ore in Italy has lately been published in the London *Iron and Coal Trades Review*. It is being used in a plant established recently at Porto Marghera near Venice by the Società Veneta Fertilizzanti e Prodotti Chimici.

The process consists of two phases: (1) Purification of the pyrites cinders by freeing them from the copper residues; and (2) briquetting the purified cinders and also those which are not copper bearing.

The first phase is effected by treatment of the cinders with common salt and afterward by lixiviation, so that the copper contained in the cinders is transformed into a soluble salt and is then precipitated as metal while the sodium employed in the process is recovered in the form of Glauber's salt. The second phase consists in pressing the treated pyrites cinders into briquettes, which are then heated, rendering them fit for transportation without danger of breaking.

Extremely porous and permeable to gases and completely desulphurized, they constitute an "ideal" mineral ore for blast furnaces. The plant is equipped for a production of 120,000 metric tons of cinder briquettes annually, which can be smelted in blast furnaces to 100,000 tons of pig iron, one-quarter of the amount of the present Italian annual imports. In addition, about 2000 tons of copper metal and 20,000 tons of Glauber's salts will be produced. If the total yield of burnt pyrites in Italy, amounting to more than 350,000 tons each year, were utilized, the iron industry, it is claimed, could be supplied with about 200,000 metric tons of pig iron annually.

Tungsten Carbide Cutting Tools

Available Under Various Names from Several American Companies—Their Development in Recent Years

WITH several American companies offering, or about to offer, a tungsten carbide material for cutting tools, the relationship of the product of those companies to the Widia metal brought out by Friedrich Krupp, Essen, Germany, has been the subject of several inquiries to THE IRON AGE. In the subjoined data, furnished by Thomas Prosser & Son, 15 Gold Street, New York, American representatives of the Krupp company, and from other sources, the situation is set forth.

Tungsten carbide was produced in the electric furnace laboratory of Henri Moissan, the celebrated French chemist, more than 30 years ago. Although extremely hard, like most metallic carbides, this carbide was found to be too brittle for most industrial applications of hard materials and many efforts have been made to increase its strength. German investigators have been particularly active in this field and one of the important developments was a tungsten carbide and cobalt combination known as Hartmetall. This was the product of the Osram Co., Berlin, which, though an independent organization, was connected with the German General Electric Co., through exchange of patent rights on electrical applications.

Although Hartmetall was strong and was used both in Europe and the United States for drawing dies, it was not entirely suitable for use as a cutting material. The Krupp company, which had obtained sales rights for metallurgical applications of the Osram product, undertook research for a tougher tungsten carbide-cobalt combination and finally brought out its Widia metal, early mention of which appeared in THE IRON AGE of March 17, 1927, page 798.

Subsequently the General Electric Co. arranged for the manufacture of a tungsten carbide-cobalt product under Krupp patents for use in its own shops, as a cutting tool (it already having used it for wire drawing equipment) and later for both manufacturing and sales rights in the United States, its product to be known as Carboloy. These rights were later assigned to the Carboloy Co., 350 Madison Avenue, New York, which was formed during 1928. The Ludlum Steel Co., Watervliet, N. Y., and the Firth-Sterling Steel Co., McKeesport, Pa., have also secured licenses to make tungsten carbide-cobalt tools. The material marketed by the Carboloy Co., is sold under the trade name of "Carboloy," that of the Ludlum company as "Strauss Metal," and that of the Firth-Sterling company as "Dimondite."

In making its license arrangements the Krupp company reserved the right to export its own product, Widia, to the United States through its agent, Thomas Prosser & Son, New York. This includes all forms of the material except Widia for use in wire drawing dies, which are made in this country by the Union Wire Die Corporation, 333 West Sixty-second Street, New York. The Prosser company has appointed distributers for Widia metal in various industrial centers.

Product Not Always the Same

Although licensed under the same basic patent, the product of the manufacturing companies named above is not necessarily identical. The proportioning of the tungsten carbide and cobalt affects the toughness of the material, and so each manufacturer might vary his product in this particular for different applications of the tungsten carbide tools. There can also be some variation in methods of manufacture, which would affect either the quality or the speed of its production.

Manufacture of the Widia alloy begins with finely dividing and mixing the tungsten and the cobalt. This mixture is then carburated by a suitable process, and is again finely ground. The resulting product is formed to the shape desired in a powerful hydraulic or other press. While still in the soft state, of the consistency of graphite, the material is cut to any special shape required by means of a saw, if such shape cannot be produced in the dies of the press. Finally, the shaped piece is sintered in an inert atmosphere in an electric furnace, whereby it becomes so hard that its shape cannot be changed except by grinding on the special carborundum wheels developed for the purpose. The material is usually sold as a complete tool, with the tip brazed to a shank and ground to the proper shape, ready for use. Data relating to Widia tools were given in THE IRON AGE of Sept. 27, 1928, and the properties of Carboloy were outlined in the issue of Oct. 18, page 959.

Other hard tungsten compounds made in the United States include Borium, Duridium, and Hastellite. Borium is a product of the Stoody Co., Whittier, Cal.; Hastellite is made by Haynes Stellite Co., Kokomo, Ind. These materials are used chiefly in the oil fields as inserts welded on the cutting bits of rotary drilling tools by the use of Stellite or other hard welding rod. According to the Vanadium-Alloys Steel Co., Latrobe, Pa., which has been making experimental tungsten carbide alloys in its laboratories and also conducting tests of the various alloys for cutting tools, a lathe tool with a Borium point was found to operate successfully on cast iron at a speed of 200 ft. per min.

New compositions have been tested by the Vanadium-Alloys company, and one of these has cut a "semi-annealed vanadium-steel" bar at the rate of 140 ft. per min. for 15 min. Only small quantities of this composition have been tested, but it is expected that enough of the alloy for field tests in other shops will be available soon.

Other proprietary "ultra hard" materials based essentially on tungsten carbide, with which substances such as molybdenum carbide, cerium, titanium, are associated, include Tizit, Volumit, Lohmanit, Thoran. Miramant and Arboga. These are for the most part of German origin and most of them are prepared by casting, although some are sintered. Different compositions of hard alloys have been on the market for years. Stellite is a material of this class, which is intrinsically hard, and has been known to machinists for years. Tungsten carbide alone was used as early as 1912 as a substitute for jewel bearings in electric meters.

Schedule of the next instalments of the ***Business Analysis and Forecast****, by Dr. Louis H. Haney, Director, New York University Bureau of Business Research, follows:* ***Feb. 14****—Position of Iron and Steel Producers;* ***Feb. 28****—Activity in Steel Consuming Industries.*

New January Record in Iron Output

Largest First Month in Pig Iron History—Daily Rate Was 2339 Tons or 2.15 Per Cent Greater Than in December—Net Gain of One Furnace

ALL January pig iron production records were broken last month. At 111,044 gross tons per day, with returns from all companies, last month surpassed war records for that month and also for January of 1923, the record year in pig iron production. The largest January output in the war was 102,746 tons per day (in 1916), while that for January, 1923, was 104,181 tons.

Last month's rate of 111,044 tons per day was the largest since April, 1927, when the average was 114,074 tons daily.

Total January pig iron output was 3,442,370 tons, or 111,044 tons per day for the 31 days, as against 3,369,846 tons, or 108,705 tons per day, for the 31 days for December. This is a gain for January of 2339 tons per day, or 2.15 per cent. In December there was a drop as compared with November of 1.25 per cent in the daily rate, while in November there was an increase over October of 1.15 per cent. A year ago, or in January, 1928, the daily rate was 92,573 tons, making the January rate this year 20 per cent higher.

Operating Rate Active on Feb. 1

There were 202 furnaces operating on Feb. 1 with an estimated operating rate of 111,985 tons per day. This compares with 110,675 tons daily for the 201 furnaces blowing on Jan. 1. The higher rate on Feb. 1 as compared with Jan. 1, with only one more furnace operating, is due to the faster operation of some of the larger furnaces. In January, nine furnaces were blown in and eight were shut down, giving a net increase of one.

Of the nine furnaces blown in last month, four were Steel Corporation stacks, one belonged to an independent steel company and four were merchant furnaces. Of the eight furnaces put on the idle list, five belonged to the Steel Corporation, one was an independent steel company stack and two were merchant furnaces. Thus there was a net loss of

Daily Average Production of Coke Pig Iron in the United States by Months Since Jan. 1, 1925—Gross Tons

	1925	1926	1927	1928	1929
Jan.	108,720	106,974	100,123	92,573	111,044
Feb.	114,791	104,408	105,024	100,004	.....
Mar.	114,975	111,032	112,366	103,215	.....
Apr.	108,632	115,004	114,074	106,183	.....
May	94,542	112,304	109,385	105,931	.....
June	89,115	107,844	102,988	102,733	.....
½ year	105,039	109,660	107,351	101,763	.....
July	85,936	103,978	95,199	99,091	.....
Aug.	87,241	103,241	95,073	101,180	.....
Sept.	90,873	104,543	92,498	102,077	.....
Oct.	97,528	107,553	89,810	108,832	.....
Nov.	100,767	107,890	88,279	110,084	.....
Dec.	104,853	99,712	86,960	108,705	.....
Year	99,735	107,043	99,266	103,382	.....

Pig Iron Production by Districts, Gross Tons

	January (31 days)	December (31 days)	November (30 days)	October (31 days)
New York and Mass.	231,511	201,594	208,651	213,614
Lehigh Valley	94,285	87,479	100,423	96,912
Schuylkill Valley	51,532	63,984	60,185	53,364
Lower Susq. and Lebanon Valley	33,576	33,666	31,106	31,084
Pittsburgh district	717,088	719,542	747,080	741,363
Shenango Valley	112,709	99,478	99,432	101,787
Western Pennsylvania	148,098	152,890	144,135	146,988
Maryland, Va. and Ky.	98,366	98,750	105,444	111,543
Wheeling district	145,943	131,813	133,237	141,727
Mahoning Valley	346,603	329,973	317,439	347,118
Central and North'n Ohio	338,616	343,959	322,405	332,966
Southern Ohio	48,110	43,370	41,203	46,074
Illinois and Indiana	674,037	657,387	615,969	655,022
Mich., Minn., Mo., Wis., Colo. and Utah	143,873	150,737	138,163	125,979
Alabama	252,468	249,142	231,366	222,142
Tennessee	5,555	6,082	6,085	6,123
Total	3,442,370	3,369,846	3,302,523	3,373,806

Daily Rate of Pig Iron Production by Months—Gross Tons

	Steel Works Iron	Merchant Iron*	Total
January, 1928	69,520	23,053	92,573
February	78,444	21,560	100,004
March	83,489	19,726	103,215
April	85,183	21,000	106,183
May	85,576	20,355	105,931
June	81,630	21,103	102,733
July	79,513	19,578	99,091
August	82,642	18,538	101,180
September	82,590	19,487	102,077
October	88,051	20,781	108,832
November	88,474	21,610	110,084
December	85,415	23,290	108,705
January, 1929	85,530	25,514	111,044

*Includes pig iron made for the market by steel companies.

Coke Furnaces in Blast

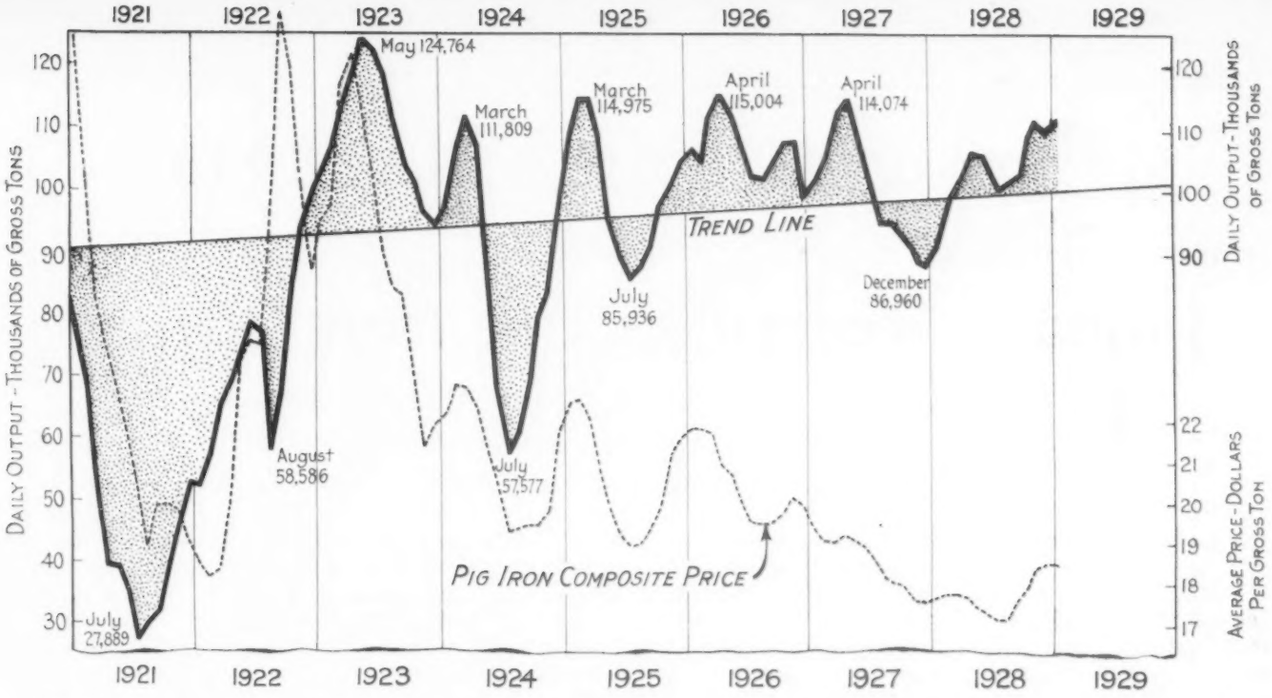
Furnaces	Feb. 1 Number in Blast	Feb. 1 Gross Tons per Day	Jan. 1 Number in Blast	Jan. 1 Gross Tons per Day
New York:				
Buffalo	13	6,560	12	6,110
Other N. Y. and Mass.	3	1,180	2	925
New Jersey	0	....	0	....
Pennsylvania:				
Lehigh Valley	6	3,040*	6	2,800*
Schuylkill Valley	4	1,660	4	1,465
Susquehanna Valley	2	1,085	2	1,085
Ferromanganese	0	....	0	....
Lebanon Valley	0	....	0	....
Ferromanganese	0	....	0	....
Pittsburgh District	35	22,730	37	23,100
FeMn. and Spiegel	3	520*	2	325
Shenango Valley	7	3,635	7	3,700
Western Pennsylvania	9	4,385	9	4,510
Ferromanganese	2	395	2	420
Maryland	5	2,575	4	2,090
Wheeling District	8	4,705	8	4,800
Ohio:				
Mahoning Valley	20	11,465	19	11,010
Central and Northern	18	10,925	18	11,095
Southern	4	1,550	4	1,480
Illinois and Indiana	33	22,700	31	21,400
Mich., Wis. and Minn.	6	2,785	6	3,000
Colo., Mo. and Utah	4	1,855	4	1,865
The South:				
Virginia	0	....	0	....
Ferromanganese	1	95	1	95
Kentucky	1	370	2	770
Alabama	17	7,580	19	8,350
Ferromanganese	0	....	1	85
Tennessee	1	190	1	195
Total	202	111,985	201	110,675

*Includes spiegeleisen.

Production of Coke Pig Iron in United States by Months Beginning Jan. 1, 1927—Gross Tons

	1927	1928	1929
Jan.	3,103,820	2,869,761	3,442,370
Feb.	2,940,679	2,900,126	.....
Mar.	3,483,362	3,199,674	.....
Apr.	3,422,226	3,185,504	.....
May	3,390,940	3,283,856	.....
June	3,089,651	3,082,000	.....
½ year	19,430,678	18,520,921	.....
July	2,951,160	3,071,824	.....
Aug.	2,947,276	3,136,570	.....
Sept.	2,774,949	3,062,314	.....
Oct.	2,784,112	3,373,806	.....
Nov.	2,648,376	3,302,523	.....
Dec.	2,695,755	3,369,846	.....
Year*	36,232,306	37,837,804	.....

*These totals do not include charcoal pig iron. The 1927 production of this iron was 164,569 tons.



Daily Pig Iron Output in January Was 2.15 Per Cent More Than in December; Composite Price Slightly Off

Inclined line represents the gradually increasing theoretical needs of the country, ascertained by a balancing of the ups and downs in production. It shows an average yearly increase in consumption of about 423,000 tons

one steel-making furnace and a net gain of two merchant furnaces.

Large Gain in Merchant Iron

An interesting feature was the gain in merchant iron production last month. At 25,514 tons per day, the merchant production was 2224 tons, or 9.5 per cent, larger than the December average of 23,290 tons per day. There was a slight gain in steel-making iron of 115 tons per day last month over December.

Furnaces Blown In and Out

The following furnaces were blown in during January: One Susquehanna furnace of the Hanna Furnace Co. in the Buffalo district; the Standish furnace of the Chateaugay Ore & Iron Co. in New York; one Clairton and one Edgar Thomson stack in the Pittsburgh district; one Sparrows Point furnace of the Bethlehem Steel Co. in Maryland; one Hubbard stack of the Youngstown Sheet & Tube Co. in the Mahoning Valley; one South Chicago and one Gary furnace of the Illinois Steel Co. in the Chicago district, and one Rockwood stack of the Roane Iron Co. in Tennessee.

During the month the following furnaces were blown out or banked: Two Edgar Thomson stacks of the Carnegie Steel Co. and one Monongahela furnace of the National Tube Co. in the Pittsburgh district; the Norton furnace of the American Rolling Mill Co. in Kentucky; two Bessemer furnaces of the Tennessee Coal, Iron & Railroad Co. and one Woodward stack of the Woodward Iron Co. in Alabama, and one Rockwood furnace of the Roane Iron Co. in Tennessee.

Large Ferromanganese Output

Ferromanganese output last month was 28,208 tons, which compares with a monthly rate of 26,000 tons in 1928. Five months last year exceeded last month's production in ferromanganese. Two companies were producing spiegeleisen last month.

Possibly Active Stacks Reduced

Five furnaces were dismantled or abandoned during January. These were the Mattie furnace of the A. M. Byers Co. in the Mahoning Valley; the Top furnace of the Wheeling Steel Corporation in the Wheeling district, and the two stacks of the Wellston Iron Furnace Co. and the Bessie furnace in southern Ohio. This reduces the number of possibly active blast furnaces in the country from 330 to 325.

Production of Steel Companies for Own Use—Gross Tons

	Total Pig Iron Spiegel and Ferromanganese			Ferromanganese*		
	1927	1928	1929	1927	1928	1929
Jan.	2,343,881	2,155,133	2,651,416	31,844	22,298	28,208
Feb.	2,256,651	2,274,880	.....	24,560	19,320	.....
Mar.	2,675,417	2,588,158	.....	27,834	27,912	.....
Apr.	2,637,919	2,555,500	.....	24,735	18,405	.....
May	2,619,078	2,652,872	.....	28,734	29,940	.....
June	2,343,409	2,448,905	.....	29,232	32,088	.....
½ year	14,876,355	14,675,448	.....	166,939	149,963	.....
July	2,163,101	2,464,896	.....	26,394	32,909	.....
Aug.	2,213,815	2,561,904	.....	21,279	24,583	.....
Sept.	2,090,200	2,477,695	.....	20,675	22,278	.....
Oct.	2,076,722	2,729,589	.....	17,710	23,939	.....
Nov.	1,938,043	2,654,211	.....	17,851	29,773	.....
Dec.	1,987,652	2,647,863	.....	20,992	28,618	.....
Year	27,345,888	30,211,606	.....	291,840	312,061	.....

*Includes output of merchant furnaces.

Total value of mineral production in the United States in 1928 was approximately $5,400,000,000, as estimated by the United States Bureau of Mines, Department of Commerce. This is a decrease of approximately 2 per cent of the total value of mineral products in 1927 and is due almost entirely to a decrease in the total value of mineral fuels.

Iron and Steel Markets

January Record in Pig Iron Output

Blast Furnaces and Steel Plants Operate at High Rate—Pressure for Railroad and Automobile Steel Stiffens Prices—Further Declines in Scrap

A JANUARY record in pig iron production, growing demand for automobile and railroad steel and increasing price strength in a number of mill products confirm the confidence of the iron and steel trade in a sustained rate of activity during the remainder of this quarter.

Pig iron production last month, according to statistics gathered by THE IRON AGE, totaled 3,442,370 tons, or 111,044 tons a day, compared with 3,369,846 tons, or 108,705 tons a day in December, a gain of 2.15 per cent in the daily rate. Output was not only the greatest for any January, but was the largest, in terms of daily average, for any month since April, 1927.

Furnaces in blast Feb. 1 numbered 202, compared with 201 one month previous. The production rate on the first of the month was 111,985 tons, or at an annual rate of 40,875,000 tons.

Railroad buying has been featured by the placing of 3900 freight cars, including 2000 for the Chicago & North Western and 1400 for the Pere Marquette. Since Jan. 1 domestic roads have ordered over 18,000 freight cars, or 35 per cent of the number purchased in the entire year 1928. Rail bookings have been augmented by purchases of 6000 tons by the Chicago & Eastern Illinois and 2000 tons by the Chicago & Western Indiana.

Pressure for shipments of automobile steel is increasing as deliveries become more extended. Some mills cannot promise shipments of automobile body sheets and cold-rolled strip until late in April. Hot-rolled strip makers are booked ahead for four to six weeks, and bar mills are well committed. The size of these backlogs is impressive in view of heavy deliveries last month. Shipments of the leading sheet producer were the greatest for any January since 1916 and have been exceeded in few other months.

An advance of $2 a ton on sheets for second quarter shipment is talked of as an early possibility, and certain mills, with heavy bookings, are stipulating that tonnage unshipped this quarter will be billed at prices prevailing at the time of delivery.

Higher prices are also looked for in hot-rolled strip. Mill obligations in the narrow sizes are so heavy that many producers are uninterested in new business at less than 2c. a lb., Pittsburgh, or $2 a ton above the recent market. The advance in cold-rolled strip announced a week ago has become more general.

Reflecting the situation in flat-rolled finished products, mills rolling semi-finished material, particularly sheet bars, are pressed for shipments and are likely to ask higher prices on second quarter contracts.

Both hot and cold-rolled bars have been affected by the expanding requirements of motor car builders, but plates and structural shapes have not been in active demand except at Chicago. Western plate producers are operating at capacity, one company having found it necessary to start a mill that had been idle since October, 1923. Railroad car purchases, oil tank awards and oil and gas line tonnage are contributing to the unusual activity. Following the receipt of specifications on a 75,000-ton gas line from the Southwest to Omaha, the Milwaukee maker of electrically welded pipe has increased its plate consumption to more than 1000 tons daily. A projected 22-in. gas line from Louisiana to St. Louis will take 100,000 tons of steel.

Steel ingot output at Chicago has risen to 92 per cent of capacity, compared with 88 per cent a fortnight ago. Operations in Greater Pittsburgh continue to average 85 per cent.

Scrap, following the break at Pittsburgh last week, has shown weakness in virtually all centers except Chicago and St. Louis. Heavy melting steel at Pittsburgh has dropped to $18.75, or $1 a ton below its peak of two weeks ago, while the same grade at Philadelphia, after advancing $1.50 to $17.50 a ton last week, has receded to $16.50. Despite the turn of the market, good steel works scrap is still reported scarce.

Pig iron buyers show little interest in second quarter requirements except in the Chicago district, where a manufacturer of gasoline motors has issued an inquiry for 30,000 tons. Increased shipping orders from automotive foundries are reported from Cleveland.

Coke prices have stiffened as a result of growing demands for domestic fuel. Recent steel company purchases of 50,000 tons of beehive furnace coke are attributed to the diversion of their own by-product fuel to the domestic market. Furnace coke is still available at $2.75 a ton, Connellsville, but with offerings diminishing some sales have been made at $2.85.

Fabricated structural steel awards total 39,500 tons, including 13,000 tons for a Philadelphia department store.

Exports of farm equipment in 1928, at $116,615,000, established a new record.

Copper has been advanced to 17.50c. a lb., delivered Connecticut Valley, the highest price since April 4, 1923.

THE IRON AGE composite price for finished steel is unchanged at 2.391c. a lb. for the ninth successive week. The pig iron composite remains at $18.38 a ton.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At Date, One Week, One Month, and One Year Previous

Pig Iron, Per Gross Ton:	Feb. 5, 1929	Jan. 29, 1929	Jan. 8, 1929	Feb. 7, 1928
No. 2 foundry, Philadelphia	$21.26	$21.26	$21.26	$20.26
No. 2, Valley furnace	17.50	17.50	17.50	17.25
No. 2, Southern, Cin'ti	20.19	20.19	20.19	19.69
No. 2, Birmingham	16.50	16.50	16.50	16.00
No. 2 foundry, Chicago*	20.00	20.00	20.00	18.50
Basic, del'd eastern Pa	19.75	19.75	19.75	19.50
Basic, Valley furnace	17.50	17.50	17.50	17.00
Valley Bessemer, del. P'gh	20.01	20.01	20.01	19.26
Malleable, Chicago*	20.00	20.00	20.00	18.50
Malleable, Valley	18.00	18.00	18.00	17.25
Gray forge, Pittsburgh	18.76	18.76	18.76	18.51
L. S. charcoal, Chicago	27.04	27.04	27.04	27.04
Ferromanganese, furnace	105.00	105.00	105.00	100.00
Rails, Billets, Etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	36.00	36.00	36.00	36.00
Bess. billets, Pittsburgh	33.00	33.00	33.00	33.00
O.-h. billets, Pittsburgh	33.00	33.00	33.00	33.00
O.-h. sheet bars, P'gh	34.00	34.00	34.00	34.00
Forging billets, P'gh	38.00	38.00	38.00	38.00
O.-h. billets, Phila	38.30	38.30	38.30	38.30
Wire rods, Pittsburgh	42.00	42.00	42.00	42.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb	1.90	1.90	1.90	1.85
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.12	2.12	2.12	2.12
Iron bars, Chicago	2.00	2.00	2.00	1.90
Steel bars, Pittsburgh	1.90	1.90	1.90	1.85
Steel bars, Chicago	2.00	2.00	2.00	1.95
Steel bars, New York	2.24	2.24	2.24	2.19
Tank plates, Pittsburgh	1.90	1.90	1.90	1.85
Tank plates, Chicago	2.00	2.00	2.00	1.95
Tank plates, New York	2.17½	2.17½	2.17½	2.17½
Beams, Pittsburgh	1.90	1.90	1.90	1.85
Beams, Chicago	2.00	2.00	2.00	1.95
Beams, New York	2.14½	2.14½	2.14½	2.14½
Steel hoops, Pittsburgh	2.10	2.10	2.10	2.20

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Sheets, Nails and Wire,	Feb. 5, 1929	Jan. 29, 1929	Jan. 8, 1929	Feb. 7, 1928
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh	2.85	2.85	2.85	2.90
Sheets, black, No. 24, Chicago dist. mill	2.95	2.95	2.95	3.00
Sheets, galv., No. 24, P'gh	3.60	3.60	3.60	3.65
Sheets, galv., No. 24, Chicago dist. mill	3.70	3.70	3.70	3.85
Sheets, blue, 9 & 10, P'gh	2.10	2.10	2.10	2.10
Sheets, blue, 9 & 10, Chicago dist. mill	2.20	2.20	2.20	2.20
Wire nails, Pittsburgh	2.65	2.65	2.65	2.55
Wire nails, Chicago dist. mill	2.70	2.70	2.70	2.60
Plain wire, Pittsburgh	2.50	2.50	2.50	2.40
Plain wire, Chicago dist. mill	2.55	2.55	2.55	2.45
Barbed wire, galv., P'gh	3.30	3.30	3.30	3.25
Barbed wire, galv., Chicago dist. mill	3.35	3.35	3.35	3.25
Tin plate, 100 lb. box, P'gh	$5.35	$5.35	$5.35	$5.25
Old Material, Per Gross Ton:				
Heavy melting steel, P'gh	*$18.75*	$18.25	$19.00	$15.00
Heavy melting steel, Phila	*16.50*	17.50	16.00	13.50
Heavy melting steel, Ch'go	16.00	16.00	14.75	12.50
Carwheels, Chicago	14.50	14.50	14.00	14.00
Carwheels, Philadelphia	16.50	16.50	16.50	15.50
No. 1 cast, Pittsburgh	*15.00*	16.00	16.00	14.50
No. 1 cast, Philadelphia	16.50	16.50	16.25	16.00
No. 1 cast, Ch'go (net ton)	**16.50**	16.00	15.75	14.50
No. 1 RR. wrot., Phila	16.00	16.00	16.00	15.25
No. 1 RR. wrot., Ch'go (net)	**14.50**	14.25	13.25	11.00
Coke, Connellsville,				
Per Net Ton at Oven:				
Furnace coke, prompt	$2.75	$2.75	$2.75	$2.60
Foundry coke, prompt	3.75	3.75	3.75	3.75
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	**17.62½**	17.12½	16.87½	14.25
Electrolytic copper, refinery	**17.25**	16.75	16.50	13.87½
Zinc, St. Louis	6.35	6.35	6.35	5.65
Zinc, New York	6.70	6.70	6.70	6.00
Lead, St. Louis	6.50	6.50	6.50	6.22½
Lead, New York	6.65	6.65	6.65	6.50
Tin (Straits), New York	**50.37½**	48.75	49.87½	53.25
Antimony (Asiatic), N. Y	**9.75**	9.62½	9.60	11.00

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Pittsburgh

Large Bookings and Shipments in January Give Steel Trade Renewed Confidence—Ingot Rate Is 85 Per Cent

PITTSBURGH, Feb. 5.—As the steel industry reviews the results of the first month of the new year, it gains confidence with respect to the remainder of the present quarter. Heavy shipments have been a common condition and those of sheets and strips have either exceeded those of any January in recent years or have established new high monthly records. In those products, fresh bookings have been very close to, and in some cases in excess of, shipments and at least another month of sustained plant engagement is assured. Bars have also done well in both shipments and new bookings. Heavy shipments of wire products do not seem to have been approximated by incoming orders and specifications, probably because of the advance named on first quarter contracts, which has not applied on the bulk of the mill deliveries of the past month.

Incoming structural shape and plate business has fallen under the movement on old orders, and there does not appear to have been much building up of backlogs in cold-finished steel bars or in tubular products. Rail shipments, so far as this district is concerned, have been at the expense of order books, but in rail fastenings the month has seen a substantial addition to mill obligations.

Viewed as a whole, January is considered a very satisfactory month, with enough extra activity in some finished lines to offset less than the usual amount of business in others. Ingot production has been consistently at 85 per cent, as an average, and that is an economical rate.

The situation still presents a somewhat uneven front both in activity and prices. Sheets, strips and bars stand out in point of business and the feature has been the insistence upon early deliveries, notably on the part of motor car builders, although among the latter there is still a marked variation in the sales and production of cars.

Production of semi-finished steel does not seem to be in excess of requirements, and prices threaten to advance on second quarter engagements. Talk is beginning to be heard of a second quarter advance on hot-rolled strips. The advance on cold-rolled strips a week ago by some producers appears since to have become more general. Bars, plates and shapes, on the other hand, show little real strength, although evidence is lacking that less than 1.90c., base Pittsburgh, has been done on new business.

Scrap prices show more tendency to weaken further than to rally from last week's setback, although it is observed that no real change has occurred in the fundamental conditions responsible for the recent strength of prices. Ingot production is holding up, and supplies of really good steel works scrap are still said to be very limited.

New business in pig iron is too small to afford a clear line on price tendencies. Some strength in fuel

prices is due largely to activity in household as distinct from industrial or railroad requirements.

Pig Iron.—Melters still seem to be meeting their needs from old purchases, and there is very little new buying. The only important inquiry is one of an unspecified tonnage for the plants of the National Radiator Corporation at Johnstown and New Castle, Pa., and Trenton, N. J., for second quarter shipment. All merchant producers report heavy shipments in January, but the lack of new sales of size has reduced the tonnage on order books. There is no real pressure to sell iron and consequently no change in prices. W. P. Snyder & Co. made the January average prices of Valley Bessemer and basic iron $18.25 and $17.50 respectively, unchanged from those of the month before.

Prices per gross ton, f.o.b. Valley furnace:

Basic	$17.50
Bessemer	18.25
Gray forge	17.00
No. 2 foundry	17.50
No. 3 foundry	17.00
Malleable	18.00
Low phos., copper free	$26.50 to 27.00

Freight rate to Pittsburgh or Cleveland district, $1.76.

Semi-Finished Steel.—A very firm market exists in billets, slabs and sheet bars, and it is probable that if any buyers now sought to supplement shipments on contracts they would be called upon to pay a premium over regular market prices. Heavy specifications on contracts are taking practically all of the current production, but an absence of spot demands suggests that the supply is ample. It is thought higher prices will be asked on tonnages for second quarter shipment, but that will depend upon how well the present demand for sheets and strips is sustained, although steel makers have some basis for advances in the increased cost of scrap. Wire rods are very firm at $42, base Pittsburgh, and are moving well. Pipe skelp is dull in keeping with conditions in welded pipe.

Bars.—January was a month of heavy shipments for all makers in this district, and incoming business does not appear to have been materially less than completed orders. Producers start February with good order books, but this condition to some extent is at the expense of prices, since in the past week or two prices higher than 1.90c., base Pittsburgh, have disappeared except on what are commonly called retail lots. Bars going into automobile construction have been eagerly sought, and there have been fairly frequent instances of one mill losing orders because delivery promises of two to three weeks were not sufficiently prompt.

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.25c.
Hoops	4.25c.
Black sheets (No. 24), 25 or more bundles	3.80c.
Galv. sheets (No. 24), 25 or more bundles	4.55c.
Blue ann'l'd sheets (No. 10), 1 to 10 sheets	3.45c.
Galv. corrug. sheets (No. 28), per square	$4.43
Spikes, large	3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, all sizes, per 100 count,	60 per cent off list
Machine bolts, 100 count,	60 per cent off list
Carriage bolts, 100 count,	60 per cent off list
Nuts, all styles, 100 count,	60 per cent off list
Large rivets, base per 100 lb.	$3.50
Wire, black soft ann'l'd, base per 100 lb.	$3.00 to 3.10
Wire, galv. soft, base per 100 lb.	3.00 to 3.10
Common wire nails, per keg	3.00
Cement coated nails, per keg	3.05

Structural Shapes. — Shipments have been heavy in the past month. New orders have not equaled deliveries on old ones. There is a fairly good inquiry for fabricated steel, but awards in this territory and to local fabricators have been so light as to occasion some concern as to sustained shop operations. The prevailing price on structural shapes is 1.90c., base Pittsburgh; some shipments on lower-priced orders carried over from last year are still going out.

Plates.—New business is not balancing shipments on old orders, and while the market is steady at 1.90c., base Pittsburgh, on bars and shapes, it is rather unsteady at that price on plates. Railroad car orders, river barges and other plate work do not entirely compensate for the lack of large outside diameter pipe business, most of which lately has gone to a Western producer.

Rails and Track Supplies.—Producers of spikes, bolts and tie plates here are well supplied with orders. They disclaim having encountered lower prices than $2.80, base, per 100 lb. for spikes, $43 per net ton for tie plates or $3.80, base, per 100 lb. for track bolts. Standard-section rails are moving well on 1929 contracts. Light-section rails still are very dull.

Wire Products. — Heavy January shipments from the mills seem not to have been accompanied by a correspondingly good movement into consumption. Specifications on first quarter contracts, consequently, are light. Producers are somewhat disturbed that on a municipal inquiry for a carload of nails a jobber made the low bid, quoting $2.70, base, per keg, against $2.75, the carload price to other than jobbers.

Tubular Goods.—Total shipments of pipe and tubing last month made a fairly satisfactory showing, but the movement was really good only in seamless goods, which have been going well to the California and mid-continent fields for deep oil wells, and in tubing, which has been well taken by the automotive, boiler and locomotive industries. Some replenishing of jobbers' stocks is going on in butt-welded pipe. The pipe line to be built to convey gas from Monroe, La., to St. Louis for the Mississippi Fuel Corporation has not yet reached pipe makers. That line will require approximately 475 miles of 22-in. pipe.

Sheets.—January shipments of the American Sheet & Tin Plate Co. were the largest for that month since 1916 and have been exceeded only a few times in any month in that company's history. Independent companies appear to have had a correspondingly good volume. Most companies seem to have done as well in new orders and specifications as in shipments, and the prospect is for sustained operation of the mills at nearly full physical capacity. Although all motor car

The Iron Age Composite Prices

Finished Steel

Feb. 5, 1929, 2.391c. a Lb.

One week ago	2.391c.
One month ago	2.391c.
One year ago	2.350c.
10-year pre-war average	1.689c.

Based on steel bars, beams, tank plates, wire, nails, black pipe and black sheets. These products make 87 per cent of the United States output of finished steel.

	High		Low	
1928	2.391c.,	Dec. 11;	2.314c.,	Jan. 3
1927	2.453c.,	Jan. 4;	2.293c.,	Oct. 25
1926	2.453c.,	Jan. 5;	2.403c.,	May 18
1925	2.560c.,	Jan. 6;	2.396c.,	Aug. 18
1924	2.789c.,	Jan. 15;	2.460c.,	Oct. 14
1923	2.824c.,	Apr. 24;	2.446c.,	Jan. 2

Pig Iron

Feb. 5, 1929, $18.38 a Gross Ton

One week ago	$18.38
One month ago	18.46
One year ago	17.67
10-year pre-war average	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1928	$18.59,	Nov. 27;	$17.04,	July 24
1927	19.71,	Jan. 4;	17.54,	Nov. 1
1926	21.54,	Jan. 5;	19.46,	July 13
1925	22.50,	Jan. 13;	18.96,	July 7
1924	22.88,	Feb. 26;	19.21,	Nov. 3
1923	30.86,	Mar. 20;	20.77,	Nov. 20

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill	1.90c.
F.o.b. Chicago	2.00c. to 2.10c.
Del'd Philadelphia	2.22c.
Del'd New York	2.24c.
Del'd Cleveland	1.92½c. to 1.95c.
F.o.b. Cleveland	1.90c. to 1.95c.
F.o.b. Lackawanna	2.00c. to 2.10c.
F.o.b. Birmingham	2.15c.
C.i.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills, 40, 50, 60-ft	2.00c.
F.o.b. Pittsburgh mills, cut lengths	2.25c.
F.o.b. Birmingham, mill lengths	2.15c.

Rail Steel

F.o.b. mills east of Chicago dist.	1.85c.
F.o.b. Chicago Heights mill	1.95c.

Iron

Common iron, f.o.b. Chicago	2.00c. to 2.10c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.12c.
Common iron, del'd New York	2.14c.

Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill	1.90c.
F.o.b. Chicago	2.00c. to 2.10c.
F.o.b. Birmingham	2.15c.
Del'd Cleveland	2.09c.
Del'd Philadelphia	2.10c. to 2.20c.
F.o.b. Coatesville	2.00c. to 2.10c.
F.o.b. Sparrows Point	2.00c. to 2.10c.
F.o.b. Lackawanna	2.00c. to 2.10c.
Del'd New York	2.17½c. to 2.27½c.
C.i.f. Pacific ports	2.20c. to 2.30c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill	1.90c.
F.o.b. Chicago	2.00c. to 2.10c.
F.o.b. Birmingham	2.15c.
F.o.b. Lackawanna	2.00c. to 2.10c.
F.o.b. Bethlehem	2.00c. to 2.10c.
Del'd Cleveland	2.09c.
Del'd Philadelphia	2.06c. to 2.16c.
Del'd New York	2.14½c. to 2.24½c.
C.i.f. Pacific ports	2.35c.

Hot-Rolled Hoops, Bands and Strips

	Base per Lb.
6 in. and narrower, P'gh	1.90c.
Wider than 6 in., P'gh	1.80c.
6 in. and narrower, Chicago	2.10c.
Wider than 6 in., Chicago	2.00c.
Cooperage stock, P'gh	2.10c.
Cooperage stock, Chicago	2.20c.

Cold-Finished Steel

	Base per Lb.
Bars, f.o.b. Pittsburgh mill	2.20c.
Bars, f.o.b. Chicago	2.20c.
Bars, Cleveland	2.25c.
Shafting, ground, f.o.b. mill	*2.55c. to 3.50c.
Strips, P'gh	2.85c. to 2.95c.
Strips, Cleveland	2.85c. to 2.95c.
Strips, del'd Chicago	3.15c. to 3.25c.
Strips, Worcester	3.00c. to 3.10c.
Fender stock, No. 20 gage, Pittsburgh or Cleveland	4.25c. to 4.35c.

*According to size.

Wire Products

(Carload lots, f.o.b. Pittsburgh and Cleveland, to jobbers and retailers.)

	Base per Keg
Wire nails	$2.65 to $2.75
Galvanized nails	4.65 to 4.75
Galvanized staples	3.35 to 3.45
Polished staples	3.10 to 3.20
Cement coated nails	2.65 to 2.75

	Base per 100 Lb.
Bright plain wire, No. 6 to No. 9 gage	$2.50 to $2.60
Annealed fence wire	2.65 to 2.75
Spring wire	3.50 to 3.60
Galv'd wire, No. 9	3.10 to 3.20
Barbed wire, galv'd	3.30 to 3.40
Barbed wire, painted	3.05 to 3.15
Woven wire fence (per net ton to retailers)	65.00

Chicago district mill and delivered Chicago prices are $1 per ton above the foregoing. Birmingham mill prices $3 a ton higher; Worcester Mass., (wire) mill $3 a ton higher on production of that plant; Duluth, Minn., mill $2 a ton higher; Anderson, Ind., $1 higher.

Cut Nails

	Per 100 Lb.
Carloads, Wheeling or Reading	$2.70
Less carloads, Wheeling or Reading	2.80

Sheets

Blue Annealed

	Base per Lb.
Nos. 9 and 10, f.o.b. P'gh	2.10c.
Nos. 9 and 10, f.o.b. Chicago dist.	2.20c.
Nos. 9 and 10, del'd Cleveland	2.29c.
Nos. 9 and 10, del'd Philadelphia	2.42c.
Nos. 9 and 10, f.o.b. Birmingham	2.25c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh	2.85c.
No. 24, f.o.b. Chicago dist. mill	2.95c.
No. 24, del'd Cleveland	3.04c.
No. 24, del'd Philadelphia	3.17c.
No. 24, f.o.b. Birmingham	3.00c.

Metal Furniture Sheets

No. 24, f.o.b. P'gh, No. 1 grade	4.00c.
No. 24, f.o.b. P'gh, No. 2 grade	3.80c.

Galvanized

No. 24, f.o.b. Pittsburgh	3.60c.
No. 24, f.o.b. Chicago dist. mill	3.70c.
No. 24, del'd Cleveland	3.79c.
No. 24, del'd Philadelphia	3.92c.
No. 24, f.o.b. Birmingham	3.75c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	3.00c.
No. 28, f.o.b. Chicago dist. mill	3.10c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh	4.10c.

Long Ternes

No. 24, 8-lb. coating, f.o.b. mill	4.00c.

Vitreous Enameling Stock

No. 24, f.o.b. Pittsburgh	3.90c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	$5.35
Standard cokes, f.o.b. Gary	5.45

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)
(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$11.20
15-lb. coating I.C.	14.00
20-lb. coating I.C.	15.30
25-lb. coating I.C.	$16.70
30-lb. coating I.C.	17.75
40-lb. coating I.C.	19.85

Alloy Steel Bars

(F.o.b. maker's mill)

Alloy Quality Bar Base, 2.65c. to 2.75c. per Lb.

S.A.E. Series Numbers		Alloy Differential
2000	(1½% Nickel)	$0.25
2100	(1¾% Nickel)	0.55
2300	(3½% Nickel)	1.50
2500	(5% Nickel)	2.25
3100	Nickel Chromium	0.55
3200	Nickel Chromium	1.35
3300	Nickel Chromium	3.80
3400	Nickel Chromium	3.20
4100	Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100	Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600	Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel)	1.05
5100	Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100	Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100	Chromium Spring Steel	0.20
6100	Chromium Vanadium Bars	1.20
6100	Chromium Vanadium Spring Steel	0.95
9250	Silicon Manganese Spring Steel (flats)	0.25
	Rounds and squares	0.50
	Chromium Nickel Vanadium	1.50
	Carbon Vanadium	0.95

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is ¾c. per lb. higher. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 down to and including 2½ in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

Slabs with sectional area of 16 in. or over carry the billet price; slabs with sectional area of 12 in. to 16 in. carry a $5 extra above the billet price and slabs with a sectional area under 12 in. carry the bar price.

Band sizes are 40c. per 100 lb. higher.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	36.00
Light (from rail steel), f.o.b. mill	34.00
Light (from billets), f.o.b. Ch'go mill	36.00

Track Equipment

	Base per 100 Lb.
Spikes, 9/16 in. and larger	$2.80
Spikes, ½ in. and smaller	2.80
Spikes, boat and barge	3.00
Tie plates, steel	2.15
Angle bars	$2.75
Track bolts, to steam railroads	$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count	70 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	45	19½	¼ and ⅜	+11	+36
¼ to ⅜	51	25½	½	23	5
½	56	42½	¾	28	11
¾	60	48½	1 and 1¼	31	15
1 to 3	62	50½	1½ and 2	35	18

Lap Weld

2	55	43½	2	23	9
2½ to 6	59	47½	2½ to 3½	28	13
7 and 8	56	43½	4 to 6	30	17
9 and 10	54	42½	7 and 8	29	16
11 and 12	53	40½	9 to 12	26	11

Butt Weld, extra strong, plain ends

⅛	41	24½	¼ and ⅜	+13	+48
¼ to ⅜	47	30½	½	23	7
½	53	42½	¾	28	12
¾	58	47½	1 to 2	34	18
1 to 1½	60	49½			
2 to 3	61	50½			

Lap Weld, extra strong, plain ends

2	53	42½	2	29	13
2½ to 4	57	46½	2½ to 4	34	20
4½ to 6	56	45½	4½ to 6	33	19
7 to 8	52	39½	7 and 8	31	17
9 and 10	45	32½	9 to 12	21	8
11 and 12	44	31½			

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel		Charcoal Iron	
2 in. and 2¼ in.	40	1½ in.	1
2½ in.—2¾ in.	48	1¾ in.	8
3 in.	54	2 in.—2¼ in.	13
3¼ in.—3¾ in.	56	2½ in.—2¾ in.	16
4 in.	59	3 in.	17
4½ in. to 6 in.	48	3¼ in. to 3½ in.	18
		4 in.	20
		4½ in.	21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	63	3 in.	48
1¼ to 1½ in.	55	3¼ to 3½ in.	50
1¾ in.	39	4 in.	53
2 to 2¼ in.	34	4½, 5 and 6 in.	42
2½ to 2¾ in.	42		

Hot Rolled

2 and 2¼ in.	40	3¼ to 3½ in.	56
2½ and 2¾ in.	48	4 in.	59
3 in.	54	4½, 5 and 6 in.	48

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb. base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points, with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage take mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base (carloads)	55
Carbon, 0.30% to 0.40%, base	50

Plus differentials for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

builders do not seem to be faring alike in orders or production, those that are busy have demands for steel sufficient to offset the slack created by those not producing and selling cars freely. The urgency for early shipments is a feature of the demand from this industry. Common finishes are doing well, and there is little deviation in the demand for sheets for metal furniture, agricultural implement or enameled ware. There is price shading, but most makers are too well supplied with orders to pay much attention to it or do not need business badly enough to meet it. The market is steady at prices named on contracts for this quarter.

Tin Plate.—Production keeps up, as container manufacturers are quite willing to accumulate stocks in view of a bright prospect of a heavy pack this year of fruits and vegetables. Independent mills are producing almost at capacity.

Cold-Finished Steel Bars and Shafting.—Not much variation in the flow of orders and specifications is noted. January did not make a big showing in shipments, as it was not until about the middle of the month that releases on contracts began to gather momentum. Prices are steady at 2.20c., base Pittsburgh or Chicago.

Hot-Rolled Flats.—All makers in this district made heavy shipments in January and some of them reached a new high monthly record. Bookings do not seem to have been materially smaller than shipments, and, with this month's releases making quite as good a showing as in the same period last month, practically full engagement of productive capacity is assured for the next four to six weeks. Prices show marked firmness as the desire on the part of manufacturers for business lessens, and there is some talk of an early advance. Producers have long had 2c., base Pittsburgh, as an objective, if it became possible to establish a single base price. Some producers now are uninterested in new business in widths under 6 in. at less than that price. Mill obligations are notably heavy in the narrow sizes.

Cold-Rolled Strips.—Movement of this product has been as heavy relatively as that in hot-rolled strips. With new bookings running equal to or in excess of shipments, makers are confidently quoting the higher price announced by some a week ago. There has been, however, too full coverage of consumers at 2.85c., base Pittsburgh, for the higher price to become promptly established.

Coke and Coal.—In fuel for household use an active market now exists, but coal and coke for industrial use, although comparatively quiet, have been helped somewhat in price by activity in domestic fuel. It is believed that recent purchases of furnace beehive oven coke by steel companies for February and March shipment, amounting to about 50,000 tons, were prompted by a desire to take advantage of a strong domestic coke market, and the beehive oven coke will replace by-product coke diverted from blast furnace to household use. The spot furnace coke market is stronger as a result of recent sales, which have reduced offerings. While most sales are at $2.75 per net ton at ovens, there are sales up to $2.85. Slack coal supplies again are ample and prices are off again.

Old Material. — Heavy melting steel is offered as low as $18.50 for March delivery, but for prompt delivery has not sold into consumption at less than $19. Consumer interest in the market remains low, since the suspension of shipments on old orders still is in force at one point in the district and other melters seem to have sufficient supplies to enable them to stay out of the market for the present. Dealers are able to pick up small lots of No. 1 heavy melting steel at $18.50, but in a general way the recent reaction in prices has been due to a change in sentiment rather than in fundamental conditions. The supply of this grade still is scant, and offerings for deferred delivery at lower prices are not representative of the current market. Cast scrap is weaker. The February scrap list of the Pennsylvania Railroad contains approximately 55,000 net tons and that of the Norfolk & Western approximately 1900 gross tons.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel	$18.50 to $19.00
No. 2 heavy melting steel	16.75 to 17.00
Scrap rails	18.00 to 18.50
Compressed sheet steel	18.50 to 19.00
Bundled sheets, sides and ends	17.00 to 17.50
Cast iron carwheels	15.00 to 15.50
Sheet bar crops, ordinary	19.00 to 19.50
Heavy breakable cast	14.00 to 14.50
No. 2 railroad wrought	18.50 to 19.00
Hvy. steel axle turnings	16.50 to 17.00
Machine shop turnings	11.50 to 12.00
Acid Open-Hearth Grades:	
Railr. knuckles and couplers	21.00 to 21.50
Railr. coil and leaf springs	21.00 to 21.50
Rolled steel wheels	21.00 to 21.50
Low phos. billet and bloom ends	22.00 to 22.50
Low phos., mill plates	20.50 to 21.00
Low phos., light grades	19.50 to 20.00
Low phos., sheet bar crops	20.50 to 21.00
Heavy steel axle turnings	16.50 to 17.00
Electric Furnace Grades:	
Low phos. punchings	19.50 to 20.00
Hvy. steel axle turnings	16.50 to 17.00
Blast Furnace Grades:	
Short shoveling steel turnings	12.50 to 13.25
Short mixed borings and turnings	12.50 to 13.25
Cast iron borings	12.50 to 13.25
Rolling Mill Grades:	
Steel car axles	21.00 to 22.00
No. 1 railroad wrought	14.50 to 15.00
Sheet bar crops	20.50 to 21.00
Cupola Grades:	
No. 1 cast	15.00 to 15.50
Rails 3 ft. and under	20.50 to 21.00

A carload of iron ore has been shipped from Kaministiquia, western Ontario, to Ottawa for testing its actual commercial possibilities for use in Canadian furnaces, according to a report received by the Department of Commerce from Assistant Trade Commissioner F. M. Rayburg, Toronto.

Germany Books Railroad Cars and Typewriters

A contract for about 100,000,000 m. ($23,800,000) worth of railroad equipment has been placed by the Rumanian Government with Otto Wolff & Co., Cologne, Germany. To become effective the contract must be confirmed by the Rumanian Parliament and approved by the German Export Credit Insurance Co.

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The Turkish Government has placed orders for 3300 typewriters with three German manufacturers and 1000 with the Remington Typewriter Co., all for prompt delivery. Since the introduction of Roman letters in Turkey, demand for typewriters has been heavy.

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An order for railroad sleeping cars totaling about $950,000 has been placed by the Chilean State Railways with the Linke Hoffmann-Busch Werke at Breslau. The contract is reported to specify complete delivery during 1929.

Acquires Rights for Billet Reheating Furnace

Freyn Engineering Co., Chicago, has acquired the American rights for the Siemens continuous regenerative furnace for reheating billets and slabs. This furnace, which is extensively used in Germany, is adapted for using coke oven gas, blast furnace gas or mixed gases.

During the 34 days ended with Dec. 31, last, the Gary, Ind., works of the Illinois Steel Co. was operated without a single lost time accident, thus establishing a new record for that plant. During this time over 3,000,000 man hours were employed, 215,000 tons of pig iron made and 320,000 tons of molten steel poured at the open-hearth furnaces and delivered to the rolling mills.

The United States Civil Service Commission, Washington, will receive applications for the position of senior mechanical engineer until March 6. The examination is to fill a vacancy in the chemical warfare service at the Edgewood, Md., Arsenal and positions requiring similar qualifications throughout the United States. Entrance salaries range from $4,600 to $5,200 a year.

The Kinite Corporation, Milwaukee, has appointed the Bissett Steel Co., with offices in Cleveland, Cincinnati and Pittsburgh, and the H. Boker Co., Inc., Boston and New York, distributers for Kinite steel alloy, for use in dies, tools and machine parts and for reinforcing wearing edges and faces by either electric or acetylene welding.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

Billets and Blooms

	Per Gross Ton
Rerolling, 4 in. and under 10 in., Pittsburgh	$33.00
Rerolling, 4 in. and under 10 in., Youngstown	33.00
Rerolling, 4 in. and under 10 in., Cleveland	$33.00 to 34.00
Rerolling, 4 in. and under 10 in., Chicago	35.00
Forging quality, Pittsburgh	38.00

Sheet Bars

(Open hearth or Bessemer)

	Per Gross Ton
Pittsburgh	$34.00
Youngstown	34.00
Cleveland	34.00

Slabs

(8 in. x 2 in. and under 10 in. x 10 in.)

	Per Gross Ton
Pittsburgh	$33.00
Youngstown	33.00
Cleveland	33.00

Skelp

(F.o.b. Pittsburgh or Youngstown)

	Per Lb.
Grooved	1.90c.
Universal	1.90c.
Sheared	1.90c.

Wire Rods

(Common soft, base)

	Per Gross Ton
Pittsburgh	$42.00
Cleveland	42.00
Chicago	43.00

Prices of Raw Material

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.55
Old range non-Bessemer, 51.50% iron	4.40
Mesabi Bessemer, 51.50% iron	4.40
Mesabi non-Bessemer, 51.50% iron	4.25
High phosphorus, 51.50% iron	4.15

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algerian	10.00c.
Iron ore, low phos., Swedish, average 68% iron	10.00c.
Iron ore, basic Swedish, average 65% iron	9.00c.
Manganese ore, washed, 52% manganese, from the Caucasus	36c. to 38c.
Manganese ore, Brazilian, African or Indian, basic 50%	35c. to 37c.
Tungsten ore, high grade, per unit, in 60% concentrates	$11.75 to $12.00

	Per Gross Ton
Chrome ore, 45 to 50% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.00 to $24.00

	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2, delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.75 to $2.85
Foundry, f.o.b. Connellsville prompt	3.50 to 4.85
Foundry, by-product, Ch'go ovens	8.00
Foundry, by-product, New England, del'd	11.00
Foundry, by-product, Newark or Jersey City, delivered	9.00 to 9.40
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry by-prod., del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.25 to $1.75
Mine run coking coal, f.o.b. W. Pa. mines	1.50 to 1.75
Gas coal, ¾-in., f.o.b. Pa. mines	1.90 to 2.00
Mine run gas coal, f.o.b. Pa. mines	1.65 to 1.75
Steam slack, f.o.b. W. Pa. mines	75c. to 85c.
Gas slack, f.o.b. W. Pa. mines	90c. to 1.10

Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard	$105.00
Foreign, 80%, Atlantic or Gulf port, duty paid	105.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$31.00 to $34.00
Domestic, 16 to 19%	29.00 to 32.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$83.50
75%	130.00

	Per Gross Ton Furnace		Per Gross Ton Furnace
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	45.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		Per Gross Ton
10%	$31.00	12%	$35.00
11%	33.00		

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		Per Gross Ton
6%	$24.00	10%	$29.00
7%	25.00	11%	31.00
8%	26.00	12%	33.00
9%	27.00		

Other Ferroalloys

Ferrotungsten, per lb., contained metal del'd ..... 98c. to $1.05
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads ..... 11.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace ..... $3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads $160.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton $91.00
Ferrophosphorus, electric 24%, f.o.b. Anniston, Ala., per gross ton $122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines	$18.00
No. 2 lump, Illinois and Kentucky mines	20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	$18.00 to 19.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	32.50

Fire Clay Brick

Per 1000 f.o.b. Works

	High-Heat Duty Brick	Intermediate Heat Duty Brick
Pennsylvania	$43.00 to $46.00	$35.00 to $38.00
Maryland	43.00 to 46.00	35.00 to 38.00
New Jersey	50.00 to 65.00	.....
Ohio	43.00 to 46.00	35.00 to 38.00
Kentucky	43.00 to 46.00	35.00 to 38.00
Missouri	43.00 to 46.00	35.00 to 38.00
Illinois	43.00 to 46.00	35.00 to 38.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$45.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00
Standard size	45.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

Per 100 Pieces

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
Machine bolts	70
†Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped, square	70
Hot-pressed nuts, blank or tapped, hexagons	70
C.p.c. and t. square or hex. nuts, blank or tapped	70
Washers*	7.00c. to 6.75c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.

†Bolts with rolled thread up to and including ⅛ in. x 6 in take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	70
Semi-finished hexagon castellated nuts, S.A.E.	70
Stove bolts in packages, Pittsburgh	80, 10 and 5
Stove bolts in packages, Chicago	80, 10 and 5
Stove bolts in packages, Cleveland	75, 20, 10 and 5
Stove bolts in bulk, Pittsburgh	80, 10, 5 and 2½
Stove bolts in bulk, Chicago	80, 10, 5 and 2½
Stove bolts in bulk, Cleveland	75, 20, 10, 5 and 2½
Tire bolts	60, 5 and 5

Discounts of 70 per cent off on bolts and nuts applied on carload business. For less than carload orders discounts of 55 to 60 per cent apply.

Large Rivets

(½-In. and Larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.90 to $3.10
F.o.b. Chicago	3.00 to 3.20

Small Rivets

(⅞-In. and Smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70 and 10
F.o.b. Cleveland	70 and 10
F.o.b. Chicago	70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10 and 5
Milled standard set screws, case hardened	80 and 5
Milled headless set screws, cut thread	75 and 10
Upset hex. head cap screws, U.S.S. thread	85
Upset hex. cap screws, S.A.E. thread	85
Upset set screws	80, 10 and 5
Milled studs	70

Chicago

Heavy Plate Demand for Pipe Lines and Railroad Cars—Steel and Pig Iron Output Increased

CHICAGO, Feb. 5.—Demand for plates in this district is the heaviest in several years, and local capacity is fully engaged, even to one plate mill that has not been operated since late in 1923. This situation arises partly from specifications released against a large gas pipe contract which brings shipments of plates for pipe manufacture to well over 1000 tons daily. Oil storage tanks and refinery expansion account for fully 35,000 tons of steel that is now before the trade. Car shops have specified 18,000 tons, a gain of 50 per cent over the previous week. The Chicago & North Western has ordered 2000 cars, the Pere Marquette 1400 and the Rock Island an additional 250, bringing the total orders to 3650, requiring more than 40,000 tons of steel, exclusive of wheels and axles.

Orders for 6000 tons of standard-section rails have been added to makers' books. The major rail buying movement is now past, and producers are centering their efforts on meeting deliveries which daily are growing larger and which forecast heavier output before the end of the month.

Taking this market as a whole, added strength is noted in most directions. Heavier demand has resulted in the lighting of the No. 7 stack at South Chicago, the third to be put in operation by the Steel Corporation in two weeks. The count of active steel company blast furnaces in this district now stands at 27 out of 36. Ingot production has also forged ahead, the average gain being close to 92 per cent of capacity. Sales continue heavy, being well up to the average so far this year and far ahead of the average in 1928. Shipments in the first five weeks of the new year were measurably larger than in the corresponding period a year ago.

Pig Iron.—This market remains strong, with a widening incentive for buyers to weigh carefully their needs in the second quarter. One user is studying requirements for the remainder of the year. A motor manufacturer in western Michigan is inquiring for 30,000 tons of foundry iron, and several inquiries for 500 to 1000-ton lots are up in the Chicago-Milwaukee district. A melter in Milwaukee will buy 1000 tons of basic, on which recent sales have established prices at $20 a ton, Chicago. A Chicago foundry has placed 2000 tons of iron for delivery in the next three months. Spot sales are large, considering the size of producers' books.

Prices per gross ton at Chicago:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$20.00
N'th'n No. 1 fdy., sil. 2.25 to 2.75	20.50
Malleable, not over 2.25 sil	20.00
High phosphorus	20.00
Lake Super, charcoal, sil. 1.50	27.04
So'th'n No. 2 fdy. (all rail)	$22.51 to 23.01
Low phos., sil. 1 to 2, copper free	29.50
Silvery, sil. 8 per cent	30.79
Bess. ferrosilicon, 14-15 per cent	46.29

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Coke.—Current shipments of by-product foundry coke are the heaviest in years. Prices are firm at $8 a ton, f.o.b. local ovens.

Ferroalloys.—This market is quiet except as to shipments against old commitments. Foreign spiegeleisen is being offered in carloads at $34, New Orleans. The freight rate to Chicago is $7.56.

Prices delivered Chicago: 80 per cent ferromanganese, $112.56; 50 per cent ferrosilicon, $83.50 to $88.50; spiegeleisen, 19 to 21 per cent, $40.76.

Plates.—Demand for oil and gas pipe and storage tanks is commanding increased interest in this market. It is now known that the 22-in. gas line projected between the Louisiana fields and St. Louis will require 100,000 tons of plates or skelp. Late last fall an order was placed for 75,000 tons of electrically welded pipe on condition that the undertaking could be financed. This line was to supply gas to Omaha, Neb., from fields to the south. Specifications are now being received against this order, and as a consequence plate shipments for welded pipe construction are advanced above 1000 tons a day. The Humble Oil & Refining Co. may build 50 storage tanks requiring 15,000 tons. This program depends on efforts that are now being made to regulate output of crude petroleum in the Southwest fields. Bids are being taken on 15,000 tons needed for the Chicago district refinery of the Empire Oil & Gas Co. The Roxana Petroleum Corporation will use 1800 tons of plates for tanks to be erected in Texas and Arkansas. Specifications from car shops are fully 50 per cent heavier than a week ago. Among new orders for freight cars are 2000 from the Chicago & North Western, and fresh inquiry is for 500 gondolas from the Northern Pacific. Plate mills in this district are operating at capacity and one producer is placing in operation this week a mill that has not been operated since October, 1923. Deliveries range from two to three weeks. Prices remain firm at 2c. per lb., Chicago, on the bulk of going tonnage. A few scattered orders of small size bring 2.10c.

Mill prices on plates, per lb.: 2c. to 2.10c. base, Chicago.

Reinforcing Bars.—Shipments from local shops are further curtailed as frigid weather grips the Central West. Fresh inquiries are less numerous, but awards for general contracts are in greater number. Architects and engineers report that new projects are fully up to expectations for this time of the year. On the whole, the outlook appears favorable to local warehouses. Prices are clearly defined at 2.35c. per lb. for billet steel reinforcing bars out of Chicago warehouses, but occasional concessions are still being made below 2.05c. on the rail steel commodity.

Structural Material.—Producers find that specifications from structural shops are heavier than a week ago. It is doubtful if this portrays greater activity in new construction, for it may readily be only a reflection of several large contracts taken at the beginning of the year. New awards are small in total tonnage, and fresh inquiry is for not more than 3000 tons. However, a new office building project, requiring about 6000 tons, is taking shape in Chicago. Manufacturers are ordering structural shapes in fair tonnages. Prices remain at 2c. to 2.10c., Chicago, the bulk of orders being taken at the lower quotation.

Mill prices on plain material, per lb.: 2c. to 2.10c. base, Chicago.

Bars.—New demand for soft steel bars is lighter than a week ago, as most users find that recent purchases and specifications are ample to cover immediate needs. Shipments are a shade heavier than late in January because of railroad equipment building programs. Orders show a wide diversity of users, with the automobile manufacturers, makers of farm implements and producers of cold-drawn bars taking the largest tonnages. Although mills have large order books, many buyers have not contracted for the quarter and prefer to make purchases for 45 to 60 days. Local mills are fully engaged and deliveries range from four to five weeks. Prices range from 2c. to 2.10c., Chicago. Demand for alloy steel bars continues to expand and deliveries are less favorable than a week ago. Shipping schedules now being arranged for March indicate a steadily increasing demand. The iron market is quiet except in the matter of filling old orders, some of which are placed by car builders against contracts for railroad equipment. New orders and specifications for rail steel bars are heavier, and the Moline, Ill., mill is now operating double turn. Prices are firm at 1.95c. per lb., Chicago Heights.

Wire Products.—Specifications from all sources are fully equal to production, which stands at 65 per cent of capacity, or possibly a shade higher. Shipments in January were much heavier than in the first month of 1928 because of the heavy commitments made in December, which were not filed until after the turn of the year. Cold weather is said to be slowing the jobbing trade in the North and Northwest. Business in the South is less active than had been expected by sellers, and competition is unusually keen. The manufacturing trade, in all lines, continues to take heavy shipments of wire.

Rails and Track Supplies.—The major winter rail buying movement is at an end in this district, and sellers can look forward now only to new orders for miscellaneous lots. The Chicago & Eastern Illinois has ordered 4000 tons from the Illinois Steel Co. and 2000 tons from the Inland Steel Co. Rail output, which ranges from 80 to 85 per cent of capacity, is gradually expanding. Orders for track supplies total 5000 tons, and fresh inquiry is for not less than 6000 tons. The light rail market is quiet.

Prices f.o.b. mill, per gross ton: Standard section open-hearth and Bess. rails, $43; light rails, rolled from billets, $36. *Per lb.:* Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.15c.; angle bars, 2.75c.

Cold-Rolled Strip. — Output is slightly heavier, following more liberal specifications, and production has reached 70 per cent of capacity. Buying is active as a result of the $2 a ton advance announced by most producers.

Cast Iron Pipe.—This market is showing greater activity, though tonnages are scattered and of small size. There is, however, the possibility that Chicago will inquire for about 7000 tons of 8-in. to 12-in. pipe and a round tonnage of larger sizes. Among new inquiries are 500 tons of 4 to 12-in. pipe for Kenosha, Wis.; 500 tons for Madison, Wis., and 100 tons for Elgin, Ill. Whitefish Bay, Wis., has appropriated $50,000 for the construction of about four miles of 6 and 8-in. water mains. New Harmony, Ind., has placed 150 tons with the McWane Cast Iron Pipe Co. Several orders have been placed by public utilities, and it is commonly believed here that this buying movement is near an end. Winter orders for cast iron pipe have been unusually small this year. Prices are steady.

Prices per net ton, deliv'd Chicago: Water pipe, 6-in. and over, $42.20 to $45.20; 4-in., $46.20 to $49.20; Class A and gas pipe, $3 extra.

Old Material.—A steel mill has placed an order for a large tonnage of heavy melting steel at $16.50 a gross ton, delivered. Severe winter weather still hampers gathering and preparation of scrap and this, with the fact that accumulations are not as heavy this year as formerly, is forcing dealers to reach out at some distance for needed tonnages. A Chicago broker has paid at St. Louis $13.85 a gross ton for borings delivered to Chicago. The freight rate is $2.65 a ton, making the price at St. Louis $11.20. Offers have been made in the Northwest for tonnages of railroad malleable. Specialties, and in particular cast iron grades, are in more active demand. Brokers, though cautious, appear to be convinced that the Chicago market will hold in the face of lower prices to the East. The Pennsylvania is offering 55,000 tons of scrap. This list includes 10,000 tons of heavy melting steel, 11,000 tons of steel rails and 5000 tons of uncut structural material.

Prices deliv'd Chicago district consumers:

	Per Gross Ton	
Basic Open-Hearth Grades:		
Heavy melting steel	$16.00 to	$16.50
Shoveling steel	16.00 to	16.50
Frogs, switches and guards, cut apart, and misc. rails	17.00 to	17.50
Hydraul. compressed sheets	14.50 to	15.00
Drop forge flashings	12.00 to	13.00
Forg'd. cast and r'l'd steel carwheels	19.50 to	20.00
Rail'd tires, charg. box size	19.50 to	20.00
Railr'd leaf spring cut apart	19.50 to	20.00
Acid Open-Hearth Grades:		
Steel couplers and knuckles	17.00 to	17.50
Coil springs	19.50 to	20.00
Electric Furnace Grades:		
Axle turnings	15.25 to	15.75
Low phos. punchings	17.75 to	18.25
Low phos. plate, 12 in. and under	17.75 to	18.25
Blast Furnace Grades:		
Axle turnings	12.75 to	13.25
Cast iron borings	13.00 to	13.50
Short shoveling turnings	13.25 to	13.75
Machine shop turnings	10.00 to	10.50
Rolling Mill Grades:		
Iron rails	16.00 to	16.50
Rerolling rails	17.50 to	18.00
Cupola Grades:		
Steel rails less than 3 ft.	19.00 to	19.50
Steel rails less than 2 ft.	20.00 to	20.50
Angle bars, steel	17.50 to	18.00
Cast iron carwheels	14.50 to	15.00
Malleable Grades:		
Railroad	19.50 to	20.00
Agricultural	16.50 to	17.00
Miscellaneous:		
*Relaying rails, 56 to 60 lb.	23.00 to	25.00
*Relaying rails, 65 lb. and heav.	26.00 to	31.00
	Per Net Ton	
Rolling Mill Grades:		
Iron angles and splice bars	15.00 to	15.50
Iron arch bars and transoms	21.25 to	21.75
Iron car axles	27.50 to	28.00
Steel car axles	17.50 to	18.00
No. 1 railroad wrought	14.50 to	15.00
No. 2 railroad wrought	14.50 to	15.00
No. 1 busheling	12.50 to	13.00
No. 2 busheling	7.00 to	7.50
Locomotive tires, smooth	14.50 to	15.00
Pipes and flues	9.50 to	10.00
Cupola Grades:		
No. 1 machinery cast	16.50 to	17.00
No. 1 railroad cast	16.00 to	16.50
No. 1 agricultural cast	14.50 to	15.00
Stove plate	12.75 to	13.25
Grate bars	13.50 to	14.00
Brake shoes	12.50 to	13.00

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Sheets.—There is still evidence of unsteadiness in sheet prices, but this condition is more common to the west of Chicago than in this immediate district. Producers are well fixed as to order books, but specifications are individually small and make possible only a week's scheduling of hot mills. Releases against contracts and spot purchases for delivery at the earliest convenience of producers are affording output at 85 per cent of capacity. Most of the shipments are to the manufacturing trade, jobbers finding that distribution is small at this time of the year. Deliveries range from two to four weeks.

Base prices per lb., deliv'd from mill in Chicago: No. 24 black sheets, 3.00c.; No. 24 galv., 3.75c.; No. 10 blue ann'l'd, 2.25c. Deliv'd prices at other Western points are equal to the freight from Gary, plus the mill prices, which are 5c. per 100 lb. lower than Chicago delivered prices.

Bolts, Nuts and Rivets.—New orders and specifications from car builders and railroads are heavier. Spot buying has also assumed larger proportions and prices for odd lots are steady.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.00c.
Reinforc'g bars, billet steel	2.35c.
Reinforc'g bars, rail steel	2.05c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Bands (¼ in. in Nos. 10 and 12 gages)	3.20c.
Hoops (No. 14 gage and lighter)	3.75c.
Black sheets (No. 24)	3.80c.
Galv. sheets (No. 24)	4.65c.
Blue ann'l'd sheets (No. 10)	3.35c.
Spikes, stand. railroad	3.55c.
Track bolts	4.55c.
Rivets, structural	3.60c.
Rivets, boiler	3.60c.
	Per Cent Off List
Machine bolts	60
Carriage bolts	60
Coach or lag screws	60
Hot-pressed nuts, sq., tap. or blank	60
Hot-pressed nuts, hex., tap. or blank	60
No. 8 black ann'l'd wire, per 100 lb.	$3.30
Com. wire nails, base per keg	3.20
Cement c't'd nails, base per keg	3.20

New York Steel Treaters Plan Meetings

An unusually interesting meeting has been arranged for the New York Chapter of the American Society for Steel Treating on March 11. It will consist of a visit to the Bell Telephone Laboratories, 55 Bethune Street, New York, when an opportunity will be given to inspect the microscopy laboratories of F. F. Lucas, chairman of the chapter. There will be a demonstration of television in the auditorium by Dr. Herbert E. Ives of the research department, and, in addition, an opportunity will be afforded to witness a demonstration of some of the developments in sound pictures. Due to limited facilities, admission to these demonstrations will be by ticket only. These can be obtained by members of the chapter by addressing F. F. Lucas.

Characterized as a "Subway Meeting," the New York steel treaters will meet Monday evening, Feb. 25, to listen to an address by Col. John R. Slattery, chief engineer Board of Transportation, New York, on "Construction and Operation of the New York Subways." This meeting will be held in the auditorium of the Merchants Association, Woolworth Building, New York.

The annual smoker of the chapter is scheduled for April 1. On April 22 in Newark, N. J., E. H. Dix will be the speaker, and on May 13 in New York, J. P. Gill will address the chapter.

Sheet & Tube to Add New Open Hearths

The Youngstown Sheet & Tube Co. has started construction of new bar mills at its Indiana Harbor, Ind., plant and has let contracts for new ore bridges, one of which will replace a bridge blown down in a storm. Its improvements there, it has now been decided, will include the building of three new 250-ton open-hearth furnaces and the rebuilding and enlarging of two 100-ton furnaces.

Philadelphia

Steel Tonnage Increases—Steel Scrap Declines—Pig Iron Buying Extending Into Second Quarter

PHILADELPHIA, Feb. 5.—An increasing tonnage of new business has been appearing since the latter part of January and mills are beginning to be assured of sufficient tonnage to maintain present operations through the quarter. In addition to the 26,000 tons of plates, shapes and bars for the Chesapeake & Ohio Railroad, bids on which will be opened Feb. 13, the Norfolk & Western opened bids Feb. 1 on 8350 tons of plates, shapes and bars for 1000 57-ton hopper cars. Some months ago a sizable tonnage of plates for this railroad went to an eastern Pennsylvania mill. Steel prices, which had begun to show a slight tendency to softness on certain products toward the middle of last month, are generally firmer. Pig iron buying is beginning to extend into the second quarter. The iron and steel scrap market shows a downward movement, with No. 1 heavy melting steel off 50c. to $1 a ton on recent purchases.

Pig Iron.—Consumers of foundry grades, some of whom underestimated their requirements for the present quarter or depended upon purchases late last year to carry them through, have been buyers of small tonnage to fill in, and in a number of instances have bought for delivery well into the next quarter at the current quotation of $21 per ton, furnace. On small tonnages, which compose the greater part of present buying, the market is firm. Basic users have not yet bought on their present inquiries, being apparently unwilling to contract at the advance of 50c. a ton from the prices last paid.

Prices per gross ton at Philadelphia:

East. Pa. No. 2, 1.75 to 2.25 sil.	$21.26 to $21.76
East. Pa. No. 2X, 2.25 to 2.75 sil.	21.76 to 22.26
East. Pa. No. 1X	22.26 to 22.76
Basic (del'd east. Pa.)	19.75 to 20.25
Gray forge	20.50 to 21.00
Malleable	21.25 to 21.75
Stand. low phos. (f.o.b. N. Y. State furnace)	22.00 to 23.00
Cop. b'r'g low phos. (f.o.b. furnace)	23.00 to 23.50
Va. No. 2 plain, 1.75 to 2.25 sil.	25.29
Va. No. 2X, 2.25 to 2.75 sil.	25.79

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $4.54 from Virginia furnaces.

Bars. — Mills are comfortably booked with orders and maintaining prices firmly at 1.90c., Pittsburgh, or 2.22c., Philadelphia. Most makers report January to have been a good month as a result of the improvement in buying that developed late in the month.

Shapes.—While small lots of shapes are occasionally closed at 2.05c., Pencoyd, most current transactions are at 2c., f.o.b. nearest mill to consumer, with desirable tonnages bringing concessions to 1.95c., f.o.b. mill. Quotations delivered Philadelphia, using Pencoyd, Pa., as a basing point, range from 2.01c. to 2.06c. per lb.

Plates.—A slight tendency to softness in the quotation of 2c., Coatesville, or 2.10c., Philadelphia, which appeared about a fortnight ago, has disappeared, following a general increase in demand, which has assured plate mills of good tonnage for the rest of the quarter. A district plate mill has booked 1000 tons for shipment to the Standard Oil Co. of New Jersey at Sarnia, Ont.

Warehouse Business. — January business was larger than the total for the same month a year ago and with some jobbers was the largest of any January business in a number of years. Effective at once, jobbers in Trenton, N. J., have adopted the Philadelphia district bases and quantity extras for Allentown, Easton, the Trenton district and the State of Delaware.

Sheets.—Demand for sheets is increasing and both blue annealed and galvanized sheet prices are firmer. Blue annealed sheets are quoted at 2c. to 2.10c., Pittsburgh, or 2.32c. to 2.42c., delivered Philadelphia. Galvanized sheets, following some sales at concessions from 3.60c., Pittsburgh, or 3.92c., Philadelphia, are again fairly firm. Black sheets are unchanged in price and rather quiet at 2.85c., Pittsburgh, or 3.17c., Philadelphia. Consumers are maintaining a good rate of operation and most sheet mills are comfortably filled with tonnage to carry them through the present quarter.

Imports.—In the week ended Feb. 2 arrivals at this port consisted of 1450 tons of pig iron from British India and 350 tons of spiegeleisen from the United Kingdom.

Old Material.—A slight decline in Pittsburgh prices from the recent peak has been reflected in the eastern Pennsylvania market, and a sale of 3000 to 4000 tons of No. 1 heavy melting steel last week to a Coatesville, Pa., consumer was at $17 per ton, a 50c. reduction from the price paid by the same consumer about a fortnight ago. Another eastern Pennsylvania consumer has closed on a sizable tonnage of No. 1 heavy melting steel at $16.50 per ton, Steelton and Bethlehem, Pa., so that the current market on heavy melting steel is quotable at $16.50 to $17 per ton, delivered eastern Pennsylvania. Other grades have been inactive and are nominally unchanged in the absence of transactions.

Prices per gross ton delivered consumers' yards. Philadelphia district:

No. 1 heavy melting steel	$16.50 to $17.00
Scrap T rails	16.00 to 16.50
No. 2 heavy melting steel	$13.00 to 13.50
No. 1 railroad wrought	16.00 to 16.50
Bundled sheets (for steel works)	11.00 to 11.50
Hydraulic compressed, new	15.00 to 16.25
Hydraulic compressed, old	13.50 to 14.00
Machine shop turnings (for steel works)	11.75 to 12.00
Heavy axle turnings (or equiv.)	13.50 to 14.00
Cast borings (for steel works and roll. mill)	11.00 to 11.50
Heavy breakable cast (for steel works)	16.00 to 16.50
Railroad grate bars	12.50 to 13.00
Stove plate (for steel works)	12.50 to 13.00
No. 1 low phos., hvy., 0.04% and under	20.00 to 21.00
Couplers and knuckles	19.00 to 19.50
Rolled steel wheels	18.50
No. 1 blast f'nace scrap	10.00 to 11.00
Wrot. iron and soft steel pipes and tubes (new specific.)	15.50 to 16.00
Shafting	18.50 to 19.00
Steel axles	22.00 to 23.00
No. 1 forge fire	13.00 to 13.50
Cast iron carwheels	16.50 to 17.00
No. 1 cast	16.50 to 17.00
Cast borings (for chem. plant)	15.00
Steel rails for rolling	17.00 to 17.50

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.70c.
Plates, ⅜-in.	2.90c.
Structural shapes	2.70c.
Soft steel bars, small shapes, iron bars (except bands)	2.80c.
Round-edge iron	3.50c.
Round-edge steel, iron finished 1½ x 1½ in.	3.50c.
Round-edge steel, planished	4.30c.
Reinforc. steel bars, sq. twisted and deform.	2.60c. to 2.80c.
Cold-fin. steel, rounds and hex	3.45c.
Cold-fin. steel, sq. and flats	3.95c.
Steel hoops	3.40c.
Steel bands, No. 12 to ⅜-in., inclus.	3.15c.
Spring steel	5.00c.
*Black sheets (No. 24)	4.00c.
†Galvanized sheets (No. 24)	4.75c.
Blue ann'l'd sheets (No. 10)	3.15c.
Diam. pat. floor plates—	
¼-in.	5.30c.
⅜-in.	5.50c.
Rails	3.20c.
Swedish iron bars	6.60c.

*For 50 bundles or more; 10 to 49 bun., 4.10c. base; 1 to 9 bun., 4.35c. base.
†For 50 bundles or more; 10 to 49 bun., 4.95c. base; 1 to 9 bun., 5.30c. base.

Youngstown

Valley Steel Production Averaging 90 Per Cent

YOUNGSTOWN, Feb. 5.—Steel companies of northeastern Ohio entered February with production averaging about 90 per cent, and indications that this rate will be maintained throughout the month. January was one of the best months, from the standpoint of production and shipments, in a long time. Makers of flat-rolled steels are unable to keep up with requirements, and on some lines of new business shipments are difficult to obtain under four weeks.

Steel manufacturers expect that automobile requirements will reach their peak in February. The Ford Motor Co. is taking heavy shipments from the Newton Steel Co. and the Mansfield Sheet & Tin Plate Co.

Last year the Warren plant of the Republic Iron & Steel Co., formerly the Trumbull Steel Co., shipped 600,000 tons of finished products, and required about 180,000 tons of semi-finished steel furnished by the steel plants of the Republic company at Youngstown.

New York

Pig Iron Melt Large But New Buying Is Light—January Steel Business Heavy

NEW YORK, Feb. 5.—Demand for pig iron is still at a low ebb, and the price situation shows no signs of strengthening. Shipments against first quarter contracts, however, are going forward at an undiminished rate, indicating that melt is well sustained. Sales in this district for the week totaled 4000 to 5000 tons. Prices continue at $17 to $18, base Buffalo, and $19.50, base eastern Pennsylvania funace, for foundry iron. A sale of a moderate tonnage brought out a price of $17, Buffalo, for No. 2 plain and $17.25 for No. 2X. The American Radiator Co. is in the market for 2000 tons for its Bayonne, N. J., plant. The A. P. Smith Mfg. Co., East Orange, N. J., has closed against an inquiry for 400 tons of foundry iron for March to June delivery.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25	$21.91 to $22.91
*Buf. No. 2, del'd east. N. J.	20.28 to 21.28
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	20.89 to 22.02
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	21.39 to 22.52
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	21.89 to 23.02

Freight rates: $4.91 from Buffalo, $1.39 to $2.52 from eastern Pennsylvania.

*Price delivered to New Jersey cities having rate of $3.28 a ton from Buffalo.

Ferroalloys.—Sales of several fairly large lots of foreign spiegeleisen are reported, but new demand is light, with specifications on contract heavy. Quotations are unchanged, with carload lots obtainable at $34 to $35, furnace. The only new business in ferromanganese is one or two 100-ton lots for early delivery with prices unchanged. Specifications on contract are exceedingly heavy.

Finished Steel.—With a record of large January sales and shipments behind them, local sellers of finished steel face the remainder of the quarter with confidence. Last month's business for some local offices was much larger than that of the first month in 1928 and also ran well ahead of December bookings. Some buyers who had not properly anticipated their requirements are now somewhat disturbed by inability to get shipments as quickly as desired, especially of sheets and strip steel. Cold-rolled strip makers have notified selling offices of an advance to 2.95c., Pittsburgh, but it is not expected that much tonnage will be sold at this price for delivery in this quarter. Prices of plates, shapes, bars and sheets are steady. Some reports of sales of steel bars at concessions appear to have been based on quotations on bar-size structurals at 2c., Bethlehem, which when figured back to a Pittsburgh base work out to about 1.80c. in some cases and to 1.85c. in others, depending on the freight rates. An eastern Pennsylvania district mill will furnish 1000 tons of plates for the Standard Oil Co. of New Jersey to be shipped to Sarnia, Ont. Structural awards include 4000 tons for a section of the New York subway, taken by the Bethlehem Steel Co., and 3850 tons for an apartment building in the Tudor City section, East Forty-second Street, to Harris Structural Steel Co. An office building at Broadway and Forty-first Street calls for 6000 tons, on which bids are being taken.

Mill prices per lb., deliv'd New York: Soft steel bars, 2.24c. to 2.34c.; plates, 2.17½c. to 2.27½c.; struc. shapes, 2.14½c. to 2.24½c.; bar iron, 2.14c. to 2.24c.

Warehouse Business. — Buying is rather irregular and confined for the most part to small lots. January business was larger than that of a year ago, as a result of activity after the middle of the month. Sheet prices are being maintained with only occasional concessions from the present schedule, a condition attributed to the firm position of the mills.

Cast Iron Pipe.—Municipalities are beginning to appear as small buyers of water pipe, but activity in contracting for spring delivery has not yet developed to any extent. White Plains, N. Y., has opened bids on 300 tons of water pipe, and Malden, Mass., takes bids this week on 300 tons. Mount Vernon, N. Y., is about to place 130 tons of 6-in. to 10-in. pipe, and Madison, N. J., has awarded about 200 tons of water pipe to the McWane Cast Iron Pipe Co. Of the large gas pipe inquiries in the market, no action has been taken by either the United Gas Improvement Co., Philadelphia, or the Brooklyn Union Gas Co.

Prices per net ton deliv'd New York: Water pipe, 6-in. and larger, $39.60 to $41.60; 4-in. and 5-in., $44.60 to $46.60; 3-in., $54.60 to $56.60; Class A and gas pipe, $3 extra.

Reinforcing Bars.—During the past week interest has centered in new jobs coming out for bids which are now being figured. A building for the National Biscuit Co. at Beacon, N. Y., will take 420 tons; a subway section in Queens, on which Philip J. Cogan is general contractor, more than 350 tons, and a garage at Jersey City, 200 tons. The office building in Manhattan for the News Syndicate, Inc., calling for about 600 tons, has not yet been placed, and other sizable projects still pending seem to indicate increasing activity late this month and early in March. The volume of small jobs placed has increased slightly during the last week or two. Prices are unchanged.

Coke.—The market continues quiet for both standard furnace and foundry, with furnace grade at $2.75 to $3 per ton, Connellsville, and standard foundry at $3.50 to $4, Connellsville. Special brands of beehive coke are quoted at $4.85 per net ton, ovens, or $8.56 per net ton, delivered to northern New Jersey, Jersey City and Newark, and $9.44 to New York and Brooklyn. By-product foundry coke

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.30c.
Soft steel bars, small shapes	3.25c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	7.00c. to 7.25c.
Cold-fin. shafting and screw stock—	
Rounds and hexagons	3.50c.
Flats and squares	4.00c.
Cold-roll. strip, soft and quarter hard	5.15c. to 5.40c.
Hoops	4.25c.
Bands	3.75c.
Blue ann'l'd sheets (No. 10)	3.85c. to 3.90c.
Long terne sheets (No. 24)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galv. annealed	5.15c.
Tire steel, 1½ x ½ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases,	4.50c. to 7.00c.

	Per Cent Off List
Machine bolts, cut thread:	
¾ x 6 in. and smaller	60
1 x 30 in. and smaller	50 to 50 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	60
¾ x 20 in. and smaller	50 to 50 and 10
Coach screws:	
½ x 6 in. and smaller	60
1 x 16 in. and smaller	50 to 50 and 10

Boiler Tubes—	Per 100 Ft.
Lap welded, 2-in.	$17.33
Seamless steel, 2-in.	20.24
Charcoal iron, 2-in.	25.00
Charcoal iron, 4-in.	67.00

Discounts on Welded Pipe

Standard Steel—	Black	Galv.
½-in. butt	46	29
¾-in. butt	51	37
1-3-in. butt	53	39
2½-6-in. lap	48	35
7 and 8-in. lap	44	17
11 and 12-in. lap	37	12
Wrought Iron—		
½-in. butt	5	+19
¾-in. butt	11	+ 9
1-1½-in. butt	14	+ 6
2-in. lap	5	+14
3-6-in. lap	11	+ 6
7-12-in. lap	3	+16

Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100 lb. base box	$6.45	$6.20
Charcoal per Box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 x 20 in.)

IC—20-lb. coating	$10.00 to $11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20	3.80c.
No. 22	3.95c.
No. 24	4.00c.
No. 26	4.10c.
No. 28*	4.25c.
No. 30	4.50c.

Sheets, Galvanized

	Per Lb.
No. 14	4.40c.
No. 16	4.25c.
No. 18	4.40c.
No. 20	4.50c.
No. 22	4.60c.
No. 24	4.75c.
No. 26	5.00c.
No. 28*	5.25c.
No. 30	5.65c.

*No. 28 and lighter 36 in. wide, 20c. higher per 100 lb.

is $9 to $9.40 per net ton, Newark or Jersey City, and $10.06, to New York or Brooklyn.

Old Material.—Brokers are offering $15.50 to $16 per ton, delivered eastern Pennsylvania, for No. 1 heavy melting steel, a reduction in buying prices of 50c. to $1 a ton from the level of a week ago. In the past week, a Coatesville, Pa., consumer closed on about 5000 tons of No. 1 heavy melting steel at $17 per ton, and a total of about 35,000 tons of No. 1 heavy melting steel was bought for delivery to Steelton and Bethlehem, Pa., at $16.50 per ton, delivered. Other grades of scrap are off slightly, yard grade of heavy melting steel having declined 50c. to 75c. per ton, steel car axles about 50c. per ton and specification pipe 25c. to 50c. per ton.

Dealers' buying prices per gross ton, f.o.b. New York:

No. 1 heavy melting steel	$12.50 to	$13.00
Heavy melting steel (yard)	8.75 to	9.25
No. 1 hvy. breakable cast.	12.50 to	13.00
Stove plate (steel works).	9.25 to	9.50
Locomotive grate bars	9.25 to	9.50
Machine shop turnings		8.25
Short shoveling turnings		8.25
Cast borings (blast furn. or steel works)	7.00 to	7.25
Mixed borings and turnings	7.00 to	7.25
Steel car axles	18.50 to	19.00
Iron car axles	24.50 to	25.00
Iron and steel pipe (1 in. dia., not under 2 ft. long)	11.75 to	12.00
Forge fire	9.00 to	9.50
No. 1 railroad wrought	12.50 to	13.00
No. 1 yard wrought, long	11.50 to	12.00
Rails for rolling	13.75 to	14.25
Cast iron carwheels	13.00 to	13.50
Stove plate (foundry)		9.50
Malleable cast (railroad)	13.00 to	14.00
Cast borings (chemical)		11.50

Prices per gross ton, deliv'd local foundries:

No. 1 machry. cast	$17.50
No. 1 hvy. cast (columns, bldg. materials, etc.), cupola size	15.50
No. 2 cast (radiators, cast boilers, etc.)	15.00

Signs of Weakness in Detroit Scrap Market

DETROIT, Feb. 5.—The old material market shows some signs of weakness. This is probably fostered by the large amount of scrap that is now being produced by the automobile industry as well as by lower-priced offers of dealers for shipment to Pittsburgh and elsewhere.

Dealers' buying prices per gross ton, f.o.b. cars, Detroit:

Hvy. melting and shov. steel	$15.00 to	$15.50
Borings and short turnings	10.00 to	10.50
Long turnings	9.25 to	9.75
No. 1 machinery cast	14.00 to	15.00
Automobile cast	20.00 to	21.00
Hydraul. comp. sheets	14.75 to	15.25
Stove plate	11.00 to	12.00
No. 1 busheling	11.00 to	11.50
Sheet clippings	9.00 to	9.50
Flashings	13.00 to	13.50

Railroad cars of 90-ton capacity are reported to come into active use in the near future in India, according to the London *Iron and Coal Trades Review*. They will be the first of their size and kind in that country. An order for 80 of these has already been placed by the Bengal-Nagpur Railway which will use them mainly for carrying ore in certain districts.

Cleveland

Steel Tonnage is Holding Up With Bars, Sheets and Strips in Strongest Demand

CLEVELAND, Feb. 5.—The demand for finished steel is holding up to the recent heavy volume, with the bulk of the tonnage in steel bars, sheets and hot and cold-rolled strip steel. While the greater part of the business is coming from the automotive industry, metal-working plants in most other lines are operating well. Road machinery manufacturers are increasing production. Deliveries have become more extended on sheets and hot and cold-rolled strip, and this situation is causing some of the consumers in the automotive field to place orders farther ahead than recently. Some of the mills cannot promise deliveries on auto body sheets and cold-rolled strip until the latter part of April.

With the Ford Motor Co. gradually pushing up production and other makers in the low-priced car field either now running at capacity or scheduled for heavy production shortly, the output of low-priced automobiles is expected to be very large for at least a few months. Some makers of higher-priced cars are getting their plants under larger production than last month.

Structural shapes are in fair demand, although new inquiry in the building field fell off the past week. Some fabricated work is going at low prices. The demand for plates continues light. Prices on heavy-rolled material are attracting little interest, as the market is steady at 1.90c., Pittsburgh, for steel bars, plates and structural material and at 1.90c. to 1.95c., Cleveland, for steel bars, the lower price being quoted by Cleveland mills and the higher by outside mills when using Cleveland as the base.

Pig Iron.—Some foundries are showing more interest than recently in second quarter contracts, but others have enough iron under contract to carry them well into that quarter and are not seeking additional commitments. Sales by Cleveland interests during the week totaled 24,000 tons in foundry and malleable grades, or somewhat more than during the previous week. February has started with an increase in shipping orders from some of the leading automobile foundries as well as from some other consumers, and shipments this month promise to show considerable gain over those of January. While shipments were moderate during the early part of January, most producers shipped all the iron they made during the month and some that had stock piles reduced their stocks. Consumers generally have low stocks and it is all that some furnaces can do to keep their customers supplied with iron as needed. No deviation is reported from recent prices. Lake furnaces continue to quote foundry and malleable iron at $18.50 to $19 for outside shipment, the lower price being named by Cleveland furnaces which are getting a portion of the business in competitive territories, although some of this business is going to Valley furnaces that are quoting $17.50. In Michigan, the price is unchanged at $20, furnace. Sales include a 2000-ton lot of foundry iron to an Indianapolis automobile manufacturer for the second quarter. The Ford Motor Co. is placing orders with outside foundries for castings for replacement parts for its old Model T cars. Pig iron for these parts will not be supplied by the Ford furnaces. Low phosphorus iron is inactive, but some of the steel foundries are busier than a few weeks ago and are more liberal in their releases.

Prices per gross ton at Cleveland:

N'th'n fdy., sil. 1.75 to 2.25		$19.50
S'th'n fdy., 1.75 to 2.25	$22.50 to	23.00
Malleable		19.50
Ohio silvery, 8 per cent		29.00
Basic Valley furnace		17.50
Stand. low phos., Valley	26.50 to	27.00

Prices, except on basic and low phosphorus, are delivered Cleveland. Freight rates: 50c. from local furnaces; $3 from Jackson, Ohio; $6 from Birmingham.

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and struct. shapes	3.00c.
Soft steel bars	3.00c.
Reinforc. steel bars	2.25c. to 2.50c.
Cold-fin. rounds and hex	3.65c.
Cold-fin. flats and sq	4.15c.
Hoops and bands, No. 12 to ¼ in., inclusive	3.25c.
Hoops and bands, No. 13 and lighter	3.65c.
Cold-finished strip	*5.95c.
Black sheets (No. 24)	3.50c.
Galvanized sheets (No. 24)	4.45c.
Blue ann'l'd sheets (No. 10)	3.25c.
No. 9 ann'l'd wire, per 100 lb	$2.95
No. 9 gal. wire, per 100 lb	3.40
Com. wire nails, base per keg	2.95

*Net base, including boxing and cutting to length.

Semi-Finished Steel.—An Ohio mill that is running short of semi-finished steel because of the full engagement of its finishing department has purchased 1000 tons of sheet bars from a Pittsburgh district producer. A local mill that is committed for the first quarter has been compelled to turn down requests from regular customers for steel in excess of the quantity covered by contracts. Specifications continue very heavy for both sheet bars and slabs.

Wire Products.—Consumers and distributers are still getting shipments against fourth quarter contracts and there has not yet been much test of the new prices, although some car lot sales have been made at the advance. Jobbers are accumulating large stocks bought at the old prices.

Sheets.—The demand of the automotive industry is taxing the capacity of most of the mills and some are booked up until late in April for auto

body sheets and for black sheets in finished grades. There is talk of a $2 a ton advance for the second quarter, and some mills whose delivery is so extended that shipments will run over into the next quarter are specifying that sheets that cannot be delivered during this quarter are to be billed at the prices prevailing at the time of shipment. All grades are moving well except galvanized sheets. Prices on galvanized sheets are irregular, with reported concessions of $2 a ton. Other grades are firm.

Reinforcing Bars.—There is a fair demand for small lots. Mill prices lack strength, but the warehouse price is well maintained at 2.44c., Cleveland. Rail steel bars are quoted at 1.95c., mill, but are not much of a factor in this market.

Cold-Finished Steel Bars.—Specifications from makers of automotive parts are heavy and deliveries of screw stock in standard sizes have become rather slow. The demand for large rounds and flats from road machine builders, which has been rather light, has improved.

Bolts, Nuts and Rivets.—There has been no test as yet of the new prices on large rivets, representing an advance of $4 a ton, as buyers, except of small lots, are under contract. The purpose of advancing prices at the present time was to get the market on a higher basis for the second quarter. Bolts and nuts are moving in good volume and prices are being well maintained.

Strip Steel.—The $2 a ton price advance on cold-rolled strip announced last week has been pretty generally adopted, effective Feb. 1, making the base price 2.95c., Cleveland and Pittsburgh, with a corresponding increase to 4.35c. for fender stock. Some of the mills evidently have discontinued efforts to maintain a price spread to cover both large and small lots and are naming a uniform 2.95c. price. Specifications have been very heavy recently and some mills are filled up until March 15. Consequently not much strip will be shipped at the higher price during the present quarter. While specifications for hot-rolled strip are good, mills are not loaded up very far ahead with orders for this material. Producers appear to be holding firmly to regular prices and extras.

Coke.—The continuance of the cold weather has caused such a heavy demand for by-product coke for domestic use that there is an acute shortage, particularly in the egg size. Prices are firm at the recent 50c. a ton advance, or $5, Ohio ovens, for egg coke, and $4.50 for nut. Connellsville heating coke is firmer, ranging from $2.90 to $3.15. Connellsville foundry coke is moving well against contracts, with no change in prices. Ohio by-product foundry coke is in good demand and unchanged at $7.75, Painesville.

Old Material.—Prices broke sharply late last week, and at present the market has a weak undertone. The sagging in prices has brought out a heavy volume of scrap. Best grade of No. 1 heavy melting steel, which brought $18 from dealers a few days ago for delivery to a local mill, is now available at $17.25, but dealers are offering only $17. The grade used by another Cleveland mill, for which dealers paid $16 a few days ago, is now selling at $15.50. Local dealers have bought machine shop turnings in Detroit at $8.50, or $1 a ton less than they paid a week ago. Blast furnace scrap is down 25c. a ton. Activity is confined to trading among dealers.

Prices per gross ton delivered consumers' yards:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$15.25 to $15.50
No. 2 heavy melting steel	15.00 to 15.25
Compressed sheet steel	15.00 to 15.50
Light bundled sheet stamp'gs	12.00 to 12.50
Drop forge flashings	12.50 to 13.00
Machine shop turnings	10.75 to 11.00
No. 1 railroad wrought	12.75 to 13.00
No. 2 railroad wrought	15.50 to 16.00
No. 1 busheling	12.50 to 13.00
Pipes and flues	9.00 to 9.50
Steel axle turnings	12.50 to 13.00
Acid Open-Hearth Grades	
Low phos. forging crops	18.50 to 19.00
Low phos., billet, bloom and slab crops	18.50 to 19.00
Low phos. sheet bar crops	17.50 to 18.00
Low phos. plate scrap	16.50 to 17.00
Blast Furnace Grades	
Cast iron borings	11.50 to 12.00
Mixed bor'g and short turn'gs	11.50 to 12.00
No. 2 busheling	11.50 to 12.00
Cupola Grades	
No. 1 cast	16.50 to 17.00
Railroad grate bars	11.00 to 12.00
Stove plate	12.00 to 12.50
Rails under 3 ft	16.75 to 17.25
Miscellaneous	
Railroad malleable	16.00 to 16.50
Rails for rolling	16.25 to 16.50

Third Dutch Blast Furnace to Be Built

The Royal Netherlands Blast Furnace & Steel Works, Ymuiden, Holland, is about to construct its third blast furnace. Its present two furnaces were built after designs of the Freyn Engineering Co., then Freyn, Brassert & Co., Chicago, in 1922.

Three Freyn-design blast furnaces are now nearing completion in Europe. One, at the plant of the Acieries Reunies de Burbach-Eich-Dudelange, Luxemburg, will have 29,000 cu. ft. capacity. Two 24,000-cu. ft. furnaces are being erected at the Mannesmann Tube Works, Huckingen, Germany.

Master Specifications for Foundry Materials

WASHINGTON, Feb. 5.—The Federal Specifications Board has issued proposed Government master specifications for foundry coke, amorphous carbon electrodes for electric steel melting furnaces, five grades of foundry facing, carbon base; and silica mold wash. The specifications provide that foundry coke shall be supplied in three grades: A, cupola; B, general and large; C, general and small. Grade A is suitable for cupola melting where a high-grade iron is desired. Grade B is suitable for general foundry purposes and for cupola melting where the highest grade of iron is not desired, while Grade C is a small coke for general foundry heating purposes. In coke as in other specifications the requirements to meet the standard are set forth in detail.

Steel Boiler Orders in 1928 About the Same as in 1927

WASHINGTON, Feb. 4.—Orders were received for 19,672 steel boilers with 17,684,811 sq. ft. of heating surface in 1928, against 19,108 boilers with 17,796,272 sq. ft. in 1927, according to reports received by the Department of Commerce from 81 manufacturers. Orders in December represented 1343 boilers with 1,308,125 sq. ft., against 1660 with 1,459,440 sq. ft. in November, and made the smallest showing since last February.

Slight changes are reported in the amount of orders (shipments, prior to 1926) for several years past, except for the sharp drop in 1921 and the fact that 1922 showed only partial recovery. In 1920 the completion of the War shipbuilding program called for many large units. The average annual footage rating for the latest decade was 17,380,725. Totals follow:

Year	Number	Square Feet
1928	19,672	17,684,811
1927	19,108	17,796,272
1926	19,130	19,702,657
1925	15,536	17,039,509
1924	14,310	16,785,978
1923	16,071	19,443,571
1922	13,958	15,248,876
1921	8,360	10,142,141
1920	13,843	21,274,244
1919	13,014	18,689,185

Pont-à-Mousson May Build Plant at Chelsea, Mass.

The Société Anonyme des Hauts Furneaux et Fonderies de Pont-à-Mousson, the large French cast iron pipe interest, is said to be planning the erection of a cast iron pipe foundry at Chelsea, Mass., to cost $2,000,000 to $3,000,000. While the report is not confirmed by the agents of the company in the United States, it is reported from Boston that the Pont-à-Mousson works recently took an option on property suitable for a pipe plant at Chelsea. About a year and a half ago the board of directors voted favorably on the proposal of certain directors to erect a plant in the United States. At that time the company negotiated to acquire an existing American plant, but was unsuccessful. It is suggested in some quarters that actual building of a pipe foundry at Chelsea may depend upon the amount of increase which may be made in the present cast iron pipe duty of 20 per cent.

Canton Foundry & Machine Co., Canton, Ohio, has opened a Pittsburgh district sales office in the Union Trust Building, with James B. Laird as manager.

St. Louis

Pig Iron Sold for Second Quarter—Railroad Buys 9000 Tons of Rails—Scrap Strong

ST. LOUIS, Feb. 5.—The pig iron market continues quiet. Virtually all requirements for first quarter melt have been covered, and the trade has been slow in ordering for second quarter. The melt has been good, but buyers want to be certain of a stable market before placing orders for delivery after April 1. Sales of the week totaled about 2500 tons. The St. Louis Gas & Coke Corporation sold about 2400 tons, all except 100 tons for second quarter. Principal sales were 500 tons each of malleable and foundry to Illinois and Indiana melters. Two other melters took 400 and 300 tons of malleable. A radiator company is in the market for 2000 tons of foundry iron, which probably will be closed this week.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	$20.00
Malleable, f.o.b. Granite City	20.50
N'th'n No. 2 fdy., deliv'd St. Louis	22.16
Southern No. 2 fdy., deliv'd	20.92
Northern malleable, deliv'd	22.16
Northern basic, deliv'd	22.16

Freight rates: 75c. (average) Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

Finished Iron and Steel.—A sale of 2000 tons of 90-lb. rails has been made by the Inland Steel Co. to the Chicago & Western Indiana Railroad. Demand for plates, shapes and bars has been very heavy, and mills are said to be well booked for the remainder of first quarter. Demand for sheets is maintained, with a greater percentage of the production for other than roofing purposes. Business is quiet with structural fabricators, especially the larger operators. Buying of reinforcing bars has been light.

Coke.—Heavy demand for domestic grades of coke from Eastern dealers has helped considerably to diminish piles of by-product ovens in the district, one company here having orders for 400 carloads for a month's delivery. Demand for furnace and foundry coke is well maintained.

Old Material.—The old material market is strong and most items on the list are higher. Strength in the market is due to such factors as dealers covering on old contracts, some buying by mills, higher prices in other markets, such as Chicago, which is attracting material from this center, and a heavy export business which is narrowing the source of supply for dealers here. The scramble for old material is reflected in high prices being paid for railroad offerings. Railroad lists follow: Baltimore & Ohio, 21,070 tons; Terminal Railway Association (St. Louis), 1050 tons; Missouri Pacific, 130 carloads; Cotton Belt, 29 carloads; Mobile & Ohio, 28 carloads, and Frisco, three carloads.

Dealers' buying prices, per gross ton, f.o.b. St. Louis district:

No. 1 heavy melting or shoveling steel	$13.50 to $14.00
No. 2 heavy melting or shoveling steel	13.00 to 13.50
No. 1 locomotive tires	14.50 to 15.00
Miscel. stand.-sec. rails including frogs, switches and guards, cut apart	15.50 to 16.00
Railroad springs	17.50 to 18.00
Bundled sheets	10.00 to 10.50
No. 2 railroad wrought	14.00 to 14.50
No. 1 busheling	10.50 to 11.00
Cast iron borings and shoveling turnings	10.50 to 11.00
Iron rails	15.00 to 15.50
Rails for rolling	16.00 to 16.50
Machine shop turnings	9.00 to 9.50
Heavy turnings	10.25 to 10.75
Steel car axles	20.00 to 20.50
Iron car axles	28.00 to 28.50
Wrot. iron bars and trans.	21.50 to 22.00
No. 1 railroad wrought	15.00 to 15.50
Steel rails, less than 3 ft.	17.00 to 17.50
Steel angle bars	14.75 to 15.25
Cast iron carwheels	15.00 to 15.50
No. 1 machinery cast	16.00 to 16.50
Railroad malleable	16.50 to 17.00
No. 1 railroad cast	15.00 to 15.50
Stove plate	13.00 to 13.50
Agricult. malleable	14.00 to 14.50
Relay. rails, 60 lb. and under	20.50 to 23.50
Relay. rails, 70 lb. and over	26.50 to 29.00

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-fin. rounds, shafting, screw stock	3.75c.
Black sheets (No. 24)	4.10c.
Galv. sheets (No. 24)	4.95c.
Blue ann'l'd sheets (No. 10)	3.45c.
Black corrug. sheets (No. 24)	4.15c.
Galv. corrug. sheets	5.00c.
Structural rivets	3.75c.
Boiler rivets	3.75c.
	Per Cent Off List
Tank rivets, ⅞-in. and smaller, 100 lb. or more	65
Less than 100 lb.	60
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-press. nuts, sq., blank or tapped, 200 lb. or more	60
Less than 200 lb.	50
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more	60
Less than 200 lb.	50

Canada

Pig Iron Demand Steady—Bids to be Taken Soon on 15,000-Ton Structural Project

TORONTO, ONT., Feb. 5.—Business in the Candian pig iron market, both as regards new orders and deliveries, is healthy. Local blast furnace representatives report no change in prices. In its report on the production and price of pig iron for December, the Dominion Bureau of Statistics, Ottawa, quoted pig iron prices for Toronto at $24.10 to $24.60, and Montreal iron at $26 to $26.50. When questioned regarding these prices, local blast furnace representatives stated that they were unable to supply the source of such information and pointed out that pig iron is still quoted at $23.60 for Toronto delivery, while the Montreal prices are now $25 to $25.50.

Prices per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	$23.60
No. 2 fdy., sil. 1.75 to 2.25	23.60
Malleable	23.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	$25.00 to 25.50
No. 2 fdy., sil. 1.75 to 2.25	25.00 to 25.50
Malleable	25.00 to 25.50
Basic	24.00 to 24.50
Imported Iron, Montreal Warehouse	
Summerlee	33.50
Carron	33.00

Structural Steel.—With the exception of the order placed last week with the Dominion Bridge Co., Toronto, for 23,500 tons of steel for the International Nickel Co., Copper Cliff, Ont., no large business has been booked recently. Additional orders from the International Nickel Co. are said to be in prospect in connection with Port Colborne, Ont., extensions. Bids will soon be called for on 15,000 tons of steel required for an office building in Toronto, for the Canadian Bank of Commerce. The site for the building is being cleared. Yolles & Rottenberg, Federal Building, Toronto, are having plans prepared for a 25-story building for which upward of 6000 tons will be required.

Old Material.—A few minor changes were reported in Montreal prices during the week, but Toronto prices remain the same. The demand for scrap continues brisk in the Toronto and Montreal markets. A few orders for heavy melting steel and turnings were booked by local dealers during the week, mostly for shipment to the Hamilton district. Sales showed marked improvement in machinery cast, malleable scrap and wrought iron grades.

Dealers' buying prices:

	Per Gross Ton		
	Toronto		Montreal
Heavy melting steel	$9.50		$8.00
Rails, scrap	10.00		9.00
No. 1 wrought	9.00	11.00 to	11.50
Machine shop turnings	7.00		5.00
Boiler plate	7.00		6.00
Heavy axle turnings	7.50		7.50
Cast borings	7.50		5.00
Steel turnings	7.00		6.50
Wrought pipe	5.00		6.00
Steel axles	14.00		20.00
Axles, wrought iron	16.00		22.00
No. 1 machinery cast	....	16.00 to	17.00
Stove plate	....		13.00
Standard carwheels	....		16.00
Malleable	....		13.00
	Per Net Ton		
No. 1 machinery cast	15.00		....
Stove plate	9.00		....
Standard carwheels	13.00		....
Malleable scrap	13.00		....

Orders received by the General Electric Co. in 1928 amounted to $348,848,512, compared with $309,784,623 for 1927, an increase of 13 per cent, President Gerard Swope has announced. Orders for the December quarter amounted to $88,162,049, compared with $76,708,532 for the last quarter of 1927, an increase of 15 per cent.

Birmingham

Steel Buying Continues at a High Rate, But Pig Iron Demand Is Slow

BIRMINGHAM, Feb. 5.—Moderate small-lot pig iron buying continues. Foundries are generally covered on their requirements for two months. Although January shipments were ahead of those of December, they were not as large as were expected by furnace interests. February shipping prospects are very good. Quotations on No. 2 foundry are unchanged from $16.50 to $17. The No. 2 Woodward furnace of the Woodward Iron Co. was blown out on Jan. 24 for repairs, leaving 17 active furnaces. Of this number, eight are on foundry, eight on basic and one on recarburizing iron.

Prices per gross ton, f.o.b. Birmingham dist. furnaces:

No. 2 fdy., 1.75 to 2.25 sil.	$16.50 to $17.00
No. 1 fdy., 2.25 to 2.75 sil.	17.00 to 17.50
Basic	16.50

Finished Steel.—New buying continues at a rate well above normal for this season. Sheets, bars, plates and rails have gained in bookings during the last few weeks. The Tennessee Coal, Iron & Railroad Co. has received an order for rails from the Illinois Central Railroad. The Pullman Car & Mfg. Co. will build 300 box cars at its Fairfield plant for the Louisville & Nashville Railroad. Mills have had heavy shipments this year. Prices are firm and unchanged. Reinforcing steel, fabricated steel and plate shops are operating at close to capacity and have good business in prospect. Twenty open-hearths were active during the past week. The Tennessee company is operating eight at Ensley and seven at Fairfield, and the Gulf States Steel Co. has five on at Alabama City.

Cast Iron Pipe.—The United States Cast Iron Pipe & Foundry Co. has booked an order for 7000 tons for an Eastern corporation, with deliveries to extend over six months. The American Cast Iron Pipe Co. received an order for 100,000 ft. for Los Angeles, and the McWane Cast Iron Pipe Co. was given an order for 60,000 ft. for the same city. Several other fair-sized municipal projects are in prospect for this month. The centrifugal pipe department of the American Cast Iron Pipe Co. resumed operations on Feb. 1 following a shutdown for improvements since Dec. 21. Quotations remain at $37 to $38 on 6-in. and larger sizes.

Coke.—Foundry coke demand has been stimulated by resumption of production by a number of foundries. Domestic coke is in urgent demand. Prices are unchanged from the $5 base for both spot and contract coke.

Old Material.—There has been a gradual increase in demand during the past three weeks, but sales are below normal for this season. Prices show greater strength in a few lines.

Prices per gross ton, deliv'd Birmingham dist. consumers' yards:

Heavy melting steel	$12.50
Scrap steel rails	$12.00 to 12.50
Short shoveling turnings	9.00
Cast iron borings	8.00
Stove plate	13.50
Steel axles	20.00
Iron axles	22.00
No. 1 railroad wrought	10.00 to 10.50
Rails for rolling	14.00 to 15.00
No. 1 cast	15.00
Tramcar wheels	13.00 to 14.00
Cast iron carwheels	13.00 to 13.50
Cast iron borings, chem.	13.50 to 14.00

Pacific Coast

Demand for Cast Iron Pipe Increases—Two Awards of Plates Total 4500 Tons

SAN FRANCISCO, Feb. 2 (*By Air Mail*).—Increased demand for cast iron pipe and plates, including the award of 3000 tons of the latter for oil storage tanks and 1500 tons for pipe lines, was the feature of this week's business on the Pacific Coast.

Pig Iron.—Sales and inquiries for foundry iron are limited to spot lots. Prices are unchanged.

Prices per gross ton at San Francisco:

*Utah basic	$25.00 to $26.00
*Utah fdy., sil. 2.75 to 3.25	25.00 to 26.00
**Indian fdy., sil. 2.75 to 3.25	24.00 to 25.00

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Bars.—Reinforcing steel bar awards this week totaled more than 800 tons and included 400 tons for the Stewart Mountain dam in Arizona, placed with the Allison Steel Mfg. Co. of Phoenix, and 375 tons for two buildings in Los Angeles booked by unnamed interests. Few large projects are pending, but there is a fair number of small jobs up for figures. Merchant bars continue firm at 2.30c., c.i.f. San Francisco and Los Angeles, while reinforcing bars, out of stock, are now holding fairly firm at 2.30c., base, on carload lots and 2.60c. on less than carload lots.

Plates.—Plate fabricators are encouraged by the fact that considerable new work has recently come out for figures. The Western Pipe & Steel Co. this week booked 3000 tons for four 134,000 and two 118,000 bbl. tanks for the Shell Oil Co., San Francisco, for its Martinez plant, 200 tons for a 24-in. welded pipe line at San Rafael for the Marin Municipal Utility District and 600 tons for a 30-in. pipe line at Monterey. Los Angeles awarded 656 tons of 30-in. double and triple riveted pipe to the Lacy Mfg. Co. The Denver Board of Water Commissioners will open bids Feb. 11 on 1512 tons of 60-in. pipe. Lacy Mfg. Co. was low bidder on 104 tons of 20 or 30-in. riveted pipe for Glendale, Cal. Quotations on small lots continue at 2.25c., c.i.f. Coast ports, but on the larger and more desirable tonnages this price is being shaded slightly.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and struc. shapes	3.15c.
Soft steel bars	3.15c.
Small angles, ¾-in. and over	3.15c.
Small angles, under ¾-in.	3.55c.
Small channels and tees, ¾-in. to 2¾-in.	3.75c.
Spring steel, ¼-in. and thicker	5.00c.
Black sheets (No. 24)	4.90c.
Blue ann'l'd sheets (No. 10)	3.80c.
Galv. sheets (No. 24)	5.30c.
Struc. rivets, ½-in. and larger	5.65c.
Com. wire nails, base per keg	$3.40
Cement c't'd nails, 100 lb. keg	3.40

Shapes.—Lettings of fabricated structural material this week exceeded 1000 tons and included 630 tons for a hotel on Geary Street, San Francisco, placed with McClintic-Marshall Co. and 165 tons for a hotel at Long Beach, Cal., taken by the same interest. Most of the new inquiries call for small lots. Domestic shapes are unchanged at 2.35c., c.i.f. Coast ports.

Cast Iron Pipe.—A considerable increase in demand is noted and several large lots are now being figured on. The Pacific States Cast Iron Pipe Co. took 909 tons of 6-in. Class 350 pipe and the American Cast Iron Pipe Co. 606 tons of the same size for Los Angeles. S. A. Moceri, Tacoma, secured 542 tons of 16-in. Class B pipe for the improvement of Pacific Avenue, Tacoma, and Ben Pearce was awarded 140 tons of 4 to 8-in. Class C for the improvement of Fanuel Street, San Diego. Pending business includes the following:

LOS ANGELES, 1350 tons, 2 to 10-in. Class B, improvement Lomita District No. 13. Bids Feb. 18.

SAN FRANCISCO, 2241 tons, 12-in. Classes A, B and C, Southern Pacific Co. Bids Feb. 7.

OAKLAND, CAL., 1103 tons, 2 to 12-in. Class B or centrifugal, East Bay Municipal Utility District. Bids Feb. 6.

SANTA ANA, CAL., 176 tons, 4 to 8-in. Class B. Bids Feb. 4.

SUISUN, CAL., 302 to 405 tons, 8 or 10-in. Class B or welded steel pipe. Bids opened and taken under advisement.

TOLEDO, WASH., 304 tons, 4 to 8-in. Class B. Bids opened.

GLENDALE, CAL., 234 tons, 20 and 24-in. Class B. United States Cast Iron Pipe & Foundry Co. low.

ABERDEEN, WASH., 240 tons, 8 and 16-in. Class B. Bids opened.

SEATTLE, 679 tons, Normandie Park improvement. Bids opened.

EUREKA, CAL., 119 tons, 8-in. Class B. Bids Feb. 5.

Rails.—The Los Angeles Harbor Commission will open bids on Feb. 13 for 415 tons of 90 lb. T rail, 17,200 tie plates and 107 tons of track spikes.

Horace T. Potts & Co., Philadelphia, have been appointed warehouse distributers in Philadelphia and eastern Pennsylvania for carbon and alloy tool steels manufactured by the Carpenter Steel Co., Reading, Pa.

Boston

Scrap Prices Tend Downward—Pig Iron Melters Taking More Interest in Second Quarter

BOSTON, Feb. 5.—Interest among foundries in pig iron for second quarter is increasing. A Springfield, Mass., district melter has closed on 2000 tons of No. 2X and No. 1X, deliveries running into second quarter; the Universal Winding Co., Providence, R. I., is in the market for 1200 tons of No. 2X and No. 1X, March, April, May and June delivery. Smaller tonnages were booked the past week for similar deliveries; total orders of about 6000 tons were divided among Buffalo district and other New York State furnaces and the Mystic Iron Works. Buyers say that a Buffalo district furnace is soliciting business at $18.50 a ton, furnace, for No. 1X, $18 for No. 2X, and $17.50 for No. 2 plain, but no transactions are reported. Two weeks ago the same furnace was reported as quoting $17 a ton, base furnace. Numerous foundries are sounding out the market, and furnaces expect that February sales will improve.

Foundry iron prices per gross ton deliv'd to most New England points:

*Buffalo, sil. 1.75 to 2.25	$21.91 to $22.91
*Buffalo, sil. 2.25 to 2.75	22.41 to 23.41
East. Penn., sil. 1.75 to 2.25	24.15 to 24.65
East. Penn., sil. 2.25 to 2.75	24.65 to 25.15
Va., sil. 1.75 to 2.25	26.91
Va., sil. 2.25 to 2.75	27.41
Ala., sil. 1.75 to 2.25	23.41 to 25.77
Ala., sil. 2.25 to 2.75	23.91 to 26.27

Freight rates: $4.91 all rail from Buffalo; $3.65 from eastern Pennsylvania; $5.21 all rail from Virginia; $6.91 to $8.77 from Alabama.
*All rail rate.

Fabricated Steel.—Fabricators report a normal run of winter business consisting mostly of small jobs at low prices. Most of the shops are in need of business, which accounts for the low prices. The large fabricators are booked into next month, however. By that time several sizable tonnages should be in the market.

Cast Iron Pipe.—Two Massachusetts utility companies have bought an aggregate of 3000 tons of pipe for 1929 requirements. The business was placed with three foundries. Boston has bought a small tonnage of 4-in. pipe, in 6-ft. lengths, from the Warren Foundry & Pipe Co., Springfield, Mass., will close bids Feb. 11 on 500 tons of 6 to 10-in. pipe, the only open municipal business in the market. Pipe makers are securing good tonnages on private negotiations. Prices quoted openly are: 4-in., $49.10 a ton, delivered common Boston freight rate points; 6 to 16-in., $44.10; 20-in., $43.60. A differential of $3 is asked on Class A and gas pipe.

Coke.—New England by-product foundry coke ovens on Feb. 1 announced that their price on such fuel is unchanged at $11 a ton, delivered within a $3.10 freight rate zone. That price has been in effect for 10 months, the longest period on record of unchanged prices. January foundry coke deliveries ran slightly ahead of those for January, 1928. Domestic coke continues in active demand. The January sales of all coke by the New England Coal & Coke Co. broke all previous monthly records by 1200 tons.

Old Material.—It is probable that old material prices have passed the peak on this buying movement. A sharp contraction in shipments of material to the Pittsburgh district is noted, but those to eastern Pennsylvania are still in good volume. The top price reported paid for No. 1 heavy melting steel the past week was $13 a ton, on cars shipping point, contrasted with $13.25 the previous week. The average top price paid, however, was $12.75 a ton, and from that level down to $12, with $12.25 the average low quotation. Some shading of prices for T rails, steel turnings and other materials is noted. A boat has just finished loading 1800 tons of scrap for shipment to Danzig. Another boat is scheduled to finish loading 5300 tons for Danzig about Feb. 15.

Buying prices per gross ton f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$12.25 to $12.75
Scrap T rails	12.00 to 12.50
Scrap girder rails	11.25 to 11.75
No. 1 railroad wrought	11.00 to 11.50
No. 1 yard wrought	9.00 to 9.50
Machine shop turnings	6.75 to 7.00
Cast iron borings (steel works and rolling mill)	6.50 to 7.00
Bundled skeleton, long	9.50 to 10.00
Forge flashings	9.50 to 10.00
Blast furnace borings and turnings	6.00 to 6.75
Forge scrap	8.50 to 9.50
Shafting	14.00 to 14.50
Steel car axles	17.00 to 17.50
Wrought pipe 1 in. in diameter (over 2 ft. long)	11.00 to 11.50
Rails for rolling	12.50 to 13.00
Cast iron borings, chemical	10.25 to 10.50

Prices per gross ton deliv'd consumers' yards:

Textile cast	$14.50 to $15.00
No. 1 machinery cast	16.00 to 16.50
No. 2 machinery cast	14.00 to 14.50
Stove plate	11.00 to 11.50
Railroad malleable	16.50 to 17.00

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars, small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway rounds	6.60c.
Norway squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tie steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold rolled steel—	
Rounds and hex	*3.55c. to 5.55c.
Squares and flats	*4.05c. to 7.05c.
Toe calk steel	6.00c.
Rivets, structural or boiler	4.50c.
	Per Cent Off List
Machine bolts	50 and 5
Carriage bolts	50 and 5
Lag screws	50 and 5
Hot-pressed nuts	50 and 5
Cold-punched nuts	50 and 5
Stove bolts	70 and 10

*Including quantity differentials.

Cincinnati

Scrap Declines Because of Lower Offers by Dealers—Heavy Demand for Coke—Pig Iron Quiet

CINCINNATI, Feb. 5.—Pig iron buyers are showing little interest in covering second quarter requirements, with the result that sales and inquiries have been light. The Marmon Motor Car Co., Indianapolis, is expected to purchase 2000 tons of Northern foundry, and the trade is looking to this transaction as a test of prices. Meanwhile, quotations are unchanged. Consumers are taking tonnages on current contracts at a liberal rate.

Prices per gross ton, deliv'd Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25	$20.39 to $20.89
Ala. fdy., sil. 1.75 to 2.25	20.19 to 20.69
Ala. fdy., sil. 2.25 to 2.75	20.69 to 21.19
Tenn. fdy., sil. 1.75 to 2.25	20.19
S'th'n Ohio silvery, 8 per cent	27.89 to 28.89

Freight rates, $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

Finished Material.—With the possible exception of structural steel, finished products are in good demand. Improvement is reported in sales of steel bars, agricultural implement manufacturers having been among the biggest buyers. Other bar users also have been specifying rather liberally. Bars, shapes and plates are firm at 1.90c. to 1.95c., Pittsburgh. Fabricating shops are feeling the effects of the off-season lull, which has compelled curtailment of operating schedules, and it may be another month before a definite pickup is dis-

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and struc. shapes	3.40c.
Bars, soft steel or iron	3.30c.
New billet reinforc. bars	3.15c.
Rail steel reinforc. bars	3.00c.
Hoops	4.05c.
Bands	3.50c.
Cold-fin. rounds and hex	3.85c.
Squares	4.35c.
Black sheets (No. 24)	3.90c.
Galvanized sheets (No. 24)	4.75c.
Blue ann'l'd sheets (No. 10)	3.45c.
Structural rivets	3.85c.
Small rivets	65 per cent off list
No. 9 ann'l'd wire, per 100 lb.	$3.00
Com. wire nails, base per keg	2.95
Cement c't'd nails, base 100 lb. keg	2.95
Chain, per 100 lb.	7.55
	Net per 100 Ft.
Lap-weld. steel boiler tubes, 2-in.	$16.00
4-in.	33.00
Seamless steel boiler tubes, 2-in.	17.00
4-in.	34.00

cernible. Steel sheet consumers have been taking large tonnages, and district mills have the best backlogs in many months. The latter are running at practically 100 per cent of capacity in all departments, with no sign of a diminution of activities in the next 30 days. Quotations are showing strength, with blue annealed sheets at 2.10c., Pittsburgh, black at 2.85c., galvanized at 3.60c., and automobile body stock at 4.10c. In the case of galvanized sheets, shading of $2 a ton on roofing and siding material for delivery in the South persists. Sheet producers are confident that the increasing costs of scrap and of semi-finished steel are bound to result in higher prices for the second quarter. The advance probably will be $2 a ton. A district maker of cold-rolled strip steel still is asking 2.85c., Pittsburgh, but is expected to announce 2.95c. for delivery after March 31. Rail steel reinforcing bars are quiet at the moment and are quoted at 1.90c., district mill.

Coke.—The shortage of domestic by-product coke for spot shipment remains acute. Producers have little, if any surplus stocks and are finding an outlet for a large portion for present output in the Detroit district, where cold weather has brought out a heavy demand. By-product foundry coke specifications have been good, especially from automobile foundries. By-product domestic coke prices will be undisturbed during February, with walnut size selling at $4.50, ovens, and No. 2 nut at $4 outside of southern Ohio. In the Cincinnati district quotations for local delivery are $5.50 on walnut, $5 on No. 2 nut and $6.50 on egg. New River beehive foundry is bringing $6 to $6.50, ovens.

Old Material.—Weakness in other scrap centers is reflected in the local market. Dealers are more conservative in making purchases and are paying 25c. a ton less for heavy melting steel than a week ago. Scrap rails, cast iron borings and short rails have declined a like amount, while rails for rolling and railroad wrought have dropped from 25c. to 50c. a ton. The Norfolk & Western is offering 3400 tons this week.

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel	$14.00 to $14.50
Scrap rails for melting	13.75 to 14.25
Loose sheet clippings	10.25 to 10.75
Bundled sheets	11.00 to 11.50
Cast iron borings	10.25 to 10.75
Machine shop turnings	9.75 to 10.25
No. 1 busheling	11.00 to 11.50
No. 2 busheling	7.50 to 8.00
Rails for rolling	14.50 to 15.00
No. 1 locomotive tires	14.25 to 14.75
No. 2 railroad wrought	14.00 to 14.50
Short rails	19.50 to 20.00
Cast iron carwheels	13.00 to 13.50
No. 1 machinery cast	19.50 to 20.00
No. 1 railroad cast	15.50 to 16.00
Burnt cast	10.50 to 11.00
Stove plate	10.50 to 11.00
Brake shoes	10.50 to 11.00
Railroad malleable	15.25 to 15.75
Agricultural malleable	14.25 to 14.75

of No. 1 machinery cast at $16.50 are noted, and some 3-ft. steel rails have been sold at $19.50. In some instances dealers are paying more for their material than the orders call for. Knuckles and couplers have strengthened, and some sales of this grade along with coil and leaf springs and rolled steel wheels have been made at $19 to $19.50.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$18.00 to $18.50
No. 2 heavy melting steel	14.25 to 14.50
Scrap rails	16.50 to 17.00
Hydraul. comp. sheets	15.25 to 15.50
Hand bundled sheets	12.50 to 13.00
Drop forge flashings	14.00 to 14.50
No. 1 busheling	17.00 to 17.50
Hvy. steel axle turnings	14.00 to 14.50
Machine shop turnings	8.00 to 8.50
No. 1 railroad wrought	13.50 to 14.00
Acid Open-Hearth Grades	
Knuckles and couplers	19.00 to 19.50
Coil and leaf springs	19.00 to 19.50
Rolled steel wheels	19.00 to 19.50
Low phos. billet and bloom ends	20.00 to 20.50
Electric Furnace Grades	
Short shov. steel turnings	13.50 to 14.00
Blast Furnace Grades	
Short mixed borings and turnings	11.50 to 12.50
Cast iron borings	12.00 to 12.50
No. 2 busheling	10.00 to 10.50
Rolling Mill grades	
Steel car axles	18.75 to 19.25
Iron axles	21.00 to 22.00
Cupola Grades	
No. 1 machinery cast	16.50 to 17.00
Stove plate	14.50 to 15.00
Locomotive grate bars	13.50 to 14.00
Steel rails, 3 ft. and under	19.50 to 20.00
Cast iron carwheels	14.00 to 14.50
Malleable Grades	
Industrial	18.00 to 18.50
Railroad	18.00 to 18.50
Agricultural	18.00 to 18.50

Buffalo

Steel Mill Operations Remain High—Pig Iron Business Quiet—Scrap Market Stronger

BUFFALO, Feb. 6.—Pig iron prices are firm for district delivery. Very little sizable tonnage has come out to give the quotations a severe test. The Massey-Harris Harvester Co. is expected to buy a round tonnage some time this week. Several users have placed 100, 200 and 300-ton orders during the past week at the prices quoted below. The last week of January brought out such heavy shipping directions as to make the month's average equal that of December.

Prices per gross ton, f.o.b. furnace:

No. 2 fdy., sil. 1.75 to 2.25	$18.00 to $18.50
No. 2X fdy., sil. 2.25 to 2.75	18.50 to 19.00
No. 1X fdy., sil. 2.75 to 3.25	19.50 to 20.00
Malleable, sil. up to 2.25	18.50 to 19.00
Basic	17.50 to 18.00
Lake Superior charcoal	27.28

Finished Iron and Steel.—Operations in local steel mills are being maintained at a high rate. Bethlehem's Lackawanna plant has increased operation to 22 open-hearths; Donner Steel Co. is operating eight open-hearths; Seneca Iron & Steel Co. is running at 90 to 95 per cent, and the Wickwire-Spencer rate is about 85 per cent. Demand is fair for bars, shapes, plates and sheets. Sheet prices are firm at 2.85c. for black; 3.60c. for galvanized; 4.10c. for automobile body and 2.10c. for blue annealed. A new 12-story hotel is being planned for Buffalo. Contract has been awarded for a new warehouse for the Cleveland & Buffalo Transit Lines.

Old Material.—The market continues very strong. The outstanding transaction the past week was the purchase of about 5000 tons of No. 1 heavy melting steel at a price between $18 and $18.50. Melting steel on recent railroad lists brought about $18, Buffalo. The Pennsylvania list, to be sent out soon, will total about 60,000 tons, it is reported. A purchase of No. 2 steel was made at a price reported to be $15. A few small sales

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and struc. shapes	3.40c.
Soft steel bars	3.30c.
Reinforcing bars	2.75c.
Cold-fin. flats, sq. and hex	4.45c.
Rounds	3.95c.
Cold rolled strip steel	5.85c.
Black sheets (No. 24)	4.20c.
Galv. sheets (No. 24)	4.85c.
Blue ann'l'd sheets (No. 10)	3.50c.
Com. wire nails, base per keg	$3.60
Black wire, base per 100 lb	3.75

State and Local Taxes Up; Federal, Down

Declines in Federal taxes have been more than offset by increasing levies by State and local governments, according to a report by the tax division of the National Industrial Conference Board, New York.

Total taxes collected in the United States during the fiscal year ended in 1927 were the largest in history. Federal expenditures constituted only 33.9 per cent of total public expenditures in 1926, compared with 37.9 per cent in 1923. State and local expenditures rose from $6,380,000,000 in 1923 to $7,687,000,000 in 1926.

State and local taxes exceeded federal taxes by 95 per cent in 1926; by only 64 per cent in 1923.

Moreover, in contrast with a steady decline in the Federal debt since the year following the World War, State and local indebtedness has mounted. Excess expenditures over tax collections are made up by fees, rents, interest and other miscellaneous income and by borrowed funds. Nearly half of the excess of expenditures in 1927 was made up by new borrowings incurred by State and local governments. The amount borrowed in 1927, $1,500,000,000, compares with approximately $1,333,000,000 in 1926.

Fabricated Structural Steel

Philadelphia Department Store Takes 13,000 Tons of 39,500-Ton Total—44,500 Tons in New Projects

WITH a department store at Philadelphia calling for 13,000 tons, awards placed during the week amounted to 39,500 tons. Other large jobs were a section of the New York subway, which took 4000 tons, and an apartment building in New York, requiring 3850 tons. New projects, involving 44,500 tons, included 15,000 tons of plates, several oil storage tanks at Houston, Tex., and 6000 tons each for a New York and a Chicago office building. Awards follow:

BOSTON, 340 tons, store and offices on Tremont Street, to unnamed fabricator.

STATE OF CONNECTICUT, 125 tons, highway bridge, to American Bridge Co.

VALHALLA, N. Y., 125 tons, highway bridge for Westchester County Park Commission, to Harris Structural Steel Co.

NEW YORK, 4000 tons, section 5, route 106 of New York subway, to Bethlehem Steel Co.

NEW YORK, 3850 tons, unit 9 of Tudor City Development, to Harris Structural Steel Co.

NEW YORK, 1150 tons, public school No. 104 in Bronx, to Oltmer Iron Works.

NEW YORK, 150 tons, Bronx County Court House, to Dreier Iron Works.

NEW YORK, 175 tons, station work for Interborough Rapid Transit Co., to American Bridge Co.

CENTRAL RAILROAD OF NEW JERSEY, 1200 tons, three highway bridges, to Bethlehem Steel Co.

PHILADELPHIA, 500 tons, sales and service building for International Harvester Co., to Bethlehem Construction Co.

PHILADELPHIA 13,000 tons, Strawbridge & Clothier building, reported to American Bridge Co.

READING, PA., 230 tons, building for Wilhelm Paint Works, to Bauman Iron Works.

GADSDEN, ALA., 800 tons, power house for Goodyear Tire & Rubber Co., to McClintic-Marshall Co.

JACKSONVILLE, FLA., 500 tons, viaduct, to Virginia Bridge & Iron Co.

BUFFALO, 150 tons, warehouse for Cleveland & Buffalo Transit Line, to Kellogg Structural Steel Co.

FORD, ONT., 300 tons, factory for Servel Corporation, Ltd., to Dominion Bridge Co.

BELLEVILLE, ONT., 100 tons, New Queen's Hotel, to Dominion Bridge Co.

CLEVELAND, 690 tons, store for Bing Furniture Co., to Massillon Bridge & Structural Co.

CLEVELAND, 240 tons, building for Pearl Street Savings & Trust Co., to National Iron & Wire Co.

CLEVELAND, 275 tons, fruit auction warehouse for Nickel Plate Railroad, to Massillon Bridge & Structural Co.

PITTSBURGH, 490 tons, plant building on Neville Island for Davison Coke & Iron Co., to McClintic-Marshall Co.

ROCK ISLAND, ILL., 1500 tons, 20 steel barges for delivery at Keokuk, Iowa, United States Engineers, to American Bridge Co.

INDIANA HARBOR, IND., 1000 tons, open-hearth building for Inland Steel Co., to Worden-Allen Co.

CHICAGO, 350 tons, building for Grigsby-Grunow Co., to an unnamed bidder.

MILWAUKEE, 200 tons, factory for Ideal Shoe Co., to Worden-Allen Co.

PHOENIX, ARIZ., 179 tons, bridges on Holbrook-Winslow Highway; general contract to Roger Brothers, Snowflake, Ariz., steel to unnamed fabricator.

LONG BEACH, CAL., 165 tons, hotel on Broadway, to McClintic-Marshall Co.

LOS ANGELES, 656 tons of plates for 30-in. riveted pipe for city, to Lacy Mfg. Co.

SAN FRANCISCO, 630 tons, hotel at Geary and Shannon Streets, to McClintic-Marshall Co.

SAN FRANCISCO, 3000 tons of plates, four 134,000 and two 118,000-bbl. tanks for Shell Oil Co., to Western Pipe & Steel Co.

SAN RAFAEL, CAL., 200 tons of plates, 24-in. welded pipe line for Marin Municipal Water District, to Western Pipe & Steel Co.

MONTEREY, CAL., 600 tons of plates, 30-in. welded pipe line for Monterey Water Co., to Western Pipe & Steel Co.

VANCOUVER, B. C., 2500 tons, hotel extension for Canadian Pacific Railway Co., to Dominion Bridge Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

BRIDGEPORT, CONN., 1000 tons, building for the New England Telephone Co.

UTICA, N. Y., 250 tons, State armory.

BEACON, N. Y., 1500 tons, building for National Biscuit Co., John W. Cowper Co., Buffalo, general contractor.

NEW YORK, 6000 tons, office building at Broadway and Forty-first Street; Buchman & Kahn, architects.

STATE OF NEW JERSEY, 250 tons, highway bridge at Union City.

ALLENTOWN, PA., 1500 tons, garage.

PHILADELPHIA, 700 tons, building for Bank of Philadelphia.

BUFFALO, 1200 tons, Burgard Vocational School (refigured).

TORONTO, ONT., 3000 tons, building at Bay and Albert Streets; Kirk Hyslop, architect.

TORONTO, 250 tons, factory for F. J. Hartz Co., Ltd., at Bay and Granville Streets.

HAMILTON, ONT., 500 tons, addition for Hamilton Cotton Co.

PORT COLBORNE, ONT., 2500 tons, addition for International Nickel Co.

CHICAGO, 1000 tons, addition to Lawyers' Building.

CHICAGO, 1600 tons, Atheneum building; Lundoff-Bicknell Co., general contractor.

CHICAGO, 6000 tons, 40-story office building at Wells and Monroe Streets.

ST. LOUIS, 1800 tons, oil storage tanks in Texas and Arkansas for Roxana Petroleum Corporation.

HOUSTON, TEX., 15,000 tons, oil storage tanks for Humble Oil & Refining Co.

DENVER, 1512 tons, 60-in. riveted, welded or lock-bar pipe; bids in.

GLENDALE, CAL., 104 tons plates, 20 or 30-in. riveted pipe; Lacy Mfg. Co., low bidder.

Radiator-Standard Sanitary Merger Agreed Upon

The plan of the merger of the American Radiator Co., New York, and the Standard Sanitary Mfg. Co., Pittsburgh, which has been approved by the directors of both companies, provides for the formation of a holding company, stock of which will be offered in exchange for the stock of the two companies on the following basis: For one share of preferred stock of the American Radiator Co., four shares of common stock in the new company; for one share of Standard Sanitary Mfg. Co. preferred stock, one share of 7 per cent cumulative preferred stock of the new company, to be callable at $175 per share; for one share of American Radiator Co. common stock, four shares of common stock in the new company, and for one share of common stock of the Standard Sanitary Mfg. Co., 1.09043 shares of common stock in the new company. The outstanding capitalization of the holding company on a basis of a complete exchange of the outstanding shares of the two companies would be 8,937,467 shares of common stock and 47,614 shares of 7 per cent cumulative preferred stock.

Tungsten deposits have been discovered in Nova Scotia during the past year, according to the London *Iron and Coal Trades Review*. Two valuable deposits of scheelite have been discovered in that country, one at Indian Path, Lunenberg County, and the other at Waverley, Halifax County.

*Principal Iron and Steel Exports from Belgium-Luxemburg in 1927**

In metric tons

Destination	Structural Steel	Plates and Sheets	Steel Rails	Other Railroad Material	Wire and Products	All Iron and Steel
United States	152,952	.....	2,920	60	1,835	171,455
Argentina	112,235	20,715	14,121	956	19,952	171,022
Brazil	.....	.....	11,187	4,658	11,333	32,384
Uruguay	.....	.....	.....	11,783	.....	11,783
British India	192,569	42,168	6,911	52,343	14,054	342,302
China	51,701	17,219	.....	.....	16,056	85,074
Dutch Indies	.....	17,458	6,989	4,873	.....	32,519
Japan	95,286	28,587	5,645	790	9,099	171,918
Belgian Congo	10,585	57	26,483	23,522	229	70,515
British South Africa	38,319	.....	.....	.....	.....	38,829
Egypt	28,243	22	.....	.....	2,845	32,552
All countries	2,016,104	541,714	208,787	136,407	339,159	4,871,639

*From a statement prepared by A. C. Thompson, Iron and Steel Division, Department of Commerce, Washington.

Non-Ferrous Metal Markets

Copper Very Active and Higher, Tin in Moderate Demand and Stronger, Lead Active and Steady, Zinc Sales Fair at Unchanged Levels

THE WEEK'S PRICES. CENTS PER POUND FOR EARLY DELIVERY

	Feb. 5	Feb. 4	Feb. 2	Feb. 1	Jan. 31	Jan. 30
Lake copper, New York	17.62½	17.37½	17.37½	17.37½	17.12½	17.12½
Electrolytic copper, N. Y.*	17.25	17.00	17.00	17.00	16.75	16.75
Straits tin, spot, N. Y.	50.37½	49.37½	....	48.87½	48.75	48.75
Lead, New York	6.65	6.65	6.65	6.65	6.65	6.65
Lead, St. Louis	6.50	6.50	6.50	6.50	6.50	6.50
Zinc, New York	6.70	6.70	6.70	6.70	6.70	6.70
Zinc, St. Louis	6.35	6.35	6.35	6.35	6.35	6.35

*Refinery quotation; price ¼c. higher delivered in the Connecticut Valley.

NEW YORK, Feb. 5.

Copper. — More excitement pervades the market than has been seen in many weeks. Consumers here and abroad have evidently become anxious and have almost overwhelmed producers with orders. There have been two sharp advances in the last week. On Friday, Feb. 1, the domestic price for electrolytic copper was advanced ¼c. to 17.25c., delivered in the Connecticut Valley. Today, another advance automatically was forced by heavy buying, this time to 17.50c. The foreign market has followed as usual. On Saturday, Feb. 2, Copper Exporters, Inc., announced an advance to 17.50c., c.i.f. usual European ports. Another advance was decided upon this morning and the announcement of its going into effect made the same day. The price now stands at 17.75c., c.i.f. European ports. Never before has such an announcement been made in the middle of the day, the usual custom being to make it effective the following morning. More or less confusion exists as to the future of the market, and higher prices are not at all improbable. Buying has been heavy each day, both here and abroad. Fairly large sales were made today in the domestic market at 17.50c., the new quotation. On Dec. 26 the price for electrolytic was 16.25c., delivered, and in the six weeks intervening, including the advance on that day and today there have been six increases. Domestic consumers are well covered for February and March and still have to buy, it is estimated, about 10 per cent of their April and about 50 per cent of their May requirements. Foreign consumers must still buy a little metal for February, with considerable for March and April, or about 65,000 gross tons altogether. January foreign sales are estimated to have been about 163,500,000 lb., with domestic at about 100,000,000 lb. Reports are to the effect that fabricated copper goods registered last month the largest tonnage on record. The Lake copper market is very strong and quotations have been advanced twice in the last week,

Metals from New York Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	52.50c. to 53.50c.
Tin, bar	54.50c. to 55.50c.
Copper, Lake	18.25c.
Copper, electrolytic	18.00c.
Copper, casting	17.75c.
Zinc, slab	7.50c. to 8.00c.
Lead, American pig	7.50c. to 8.00c.
Lead, bar	9.50c. to 10.00c.
Antimony, Asiatic	12.00c. to 13.00c.
Aluminum No. 1 ingots for remelting (guar'nt'd over 99% pure)	25.00c. to 26.00c.
Alum. ingots, No. 12 alloy,	24.00c. to 25.00c.
Babbitt metal, commerc'l grade,	30.00c. to 40.00c.
Solder, ½ and ½	33.00c. to 34.00c.

Metals from Cleveland Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	54.75c.
Tin, bar	56.75c.
Copper, Lake	18.38c.
Copper, electrolytic	18.38c.
Copper, casting	18.00c.
Zinc, slab	8.00c.
Lead, American pig	7.25c. to 7.40c.
Lead, bar	9.75c.
Antimony, Asiatic	16.00c.
Babbitt metal, medium grade	19.25c.
Babbitt metal, high grade	60.25c.
Solder, ½ and ½	34.00c.

Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base Per Lb.

Sheets—	
High brass	21.37½c.
Copper, hot rolled	26.12½c.
Copper, cold rolled, 14 oz. and heavier	27.37½c.
Seamless Tubes—	
Brass	26.25c.
Copper	27.12½c.
Brazed Brass Tubes	29.37½c.
Brass Rods	19.12½c.

From New York Warehouse

Delivered Prices, Base Per Lb.

Zinc sheets (No. 9), casks	10.00c. to 10.50c.
Zinc sheets, open	11.00c. to 11.50c.

Non-Ferrous Rolled Products

Mill prices on brass products, seamless copper tubing and copper wire were advanced ¼c. on Feb. 4, and quotations on other copper products were increased ⅜c. on the same date. Prices on lead full sheets and zinc sheets are unchanged.

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—	
High brass	21.75c.
Copper, hot rolled	26.50c.
Zinc	9.75c.
Lead (full sheets)	10.50c. to 10.75c.
Seamless Tubes—	
High brass	26.62½c.
Copper	27.62½c.
Rods—	
High brass	19.50c.
Naval brass	21.50c.
Wire—	
Copper	19.12½c.
High brass	22.25c.
Copper in Rolls	25.50c.
Brazed Brass Tubing	29.75c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of Mississippi River and also to St. Louis on shipments to points west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide	33.00c.
Tubes, base	42.00c.
Machine rods	34.00c.

Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged customers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	14.75c.	16.00c.
Copper, hvy. and wire	14.25c.	15.50c.
Copper, light and bottoms	12.25c.	13.75c.
Brass, heavy	7.75c.	9.00c.
Brass, light	6.75c.	7.75c.
Hvy. machine composition	11.00c.	12.50c.
No. 1 yel. brass turnings	9.50c.	10.25c.
No. 1 red brass or compos. turnings	10.75c.	11.50c.
Lead, heavy	5.25c.	5.75c.
Lead, tea	3.75c.	4.25c.
Zinc	3.25c.	3.75c.
Sheet aluminum	13.50c.	15.50c.
Cast aluminum	12.00c.	14.00c.

Rolled Metals, f.o.b. Chicago Warehouse

(Prices Cover Trucking to Customers' Doors in City Limits)

Sheets—	Base per Lb.
High brass	21.75c.
Copper, hot rolled	26.50c.
Copper, cold rolled, 14 oz. and heavier	28.75c.
Zinc	10.00c.
Lead, wide	10.55c.
Seamless Tubes—	
Brass	26.62½c.
Copper	27.62½c.
Brass Rods	19.50c.
Brazed Brass Tubes	29.75c.

standing today at 17.50c. to 17.62½c., delivered.

Copper Averages. — The average price for Lake copper for January, based on daily quotations in THE IRON AGE, was 16.96c., New York. The average price of electrolytic copper was 16.59c., refinery, or 16.84c., delivered in the Connecticut Valley.

Tin.—Sales of Straits tin have been light at about 700 tons for the week ended Saturday, Feb. 2. On the National Metal Exchange sales of standard tin also were not heavy. For the most part, the week has been dull and uninteresting, with only one really active day, Jan. 29, when 400 tons of Straits and 345 tons of standard tin changed hands. The market yesterday was also quiet, about 100 tons of Straits having been sold. Today a little more activity prevailed, with about 625 tons changing hands. Spot Straits tin quoted at 50.37½c., New York. The London market today was about £8 per ton higher than a week ago, with spot standard quoted at £228, future standard at £228 5s. and spot Straits at £235 10s. The Singapore price today was £228 10s. The market in London was up sharply today and yesterday and is very stiff. The premium on Straits tin over standard in London is rapidly increasing and today was £8 10s. per ton. Contrasting strongly with this is the contrary movement of large quantities of tin coming out of the Straits Settlements. Shipments from Jan. 29 to Feb. 5, inclusive, have been 2175 tons. As forecast in these reports recently, deliveries of tin into consumption in January were large at 8795 tons, the second largest on record. It is believed that one cause for this showing is the putting of fairly large stocks of tin in storage and transit. During January the world's visible supply, according to one authority, decreased 379 tons. February shipments of Straits tin are estimated to total 7500 to 8000 tons.

Lead.—Buying of lead has been active almost every day, particularly yesterday and today, and prices are strong. February and March have been principally involved, with a slight premium for March of about two and one-half points. The market in the West is quoted at 6.50c. to 6.52½c., St. Louis, for February and March. The leading interest continues to quote 6.65c., New York, as its contract price. Inquiry for April delivery is already appearing, but no sales are reported.

Zinc.—Demand for prime Western continues moderately active, with fair sales reported each day. The market is strong and quotations are firm at 6.35c., East St. Louis, or 6.70c., New York. Total sales for January are expected to reveal a fair average business. Contrary to expectations, ore prices were unchanged at the end of last week, remaining at $40, Joplin. The week's output was unchanged at 12,500 tons, with shipments larger at 12,734 tons. Stocks were further reduced, being estimated now at only 22,240 tons, less than two weeks' supply. Ore sales last week were 11,750 tons, against 11,440 tons the previous week.

Antimony.—Good consumer buying and the absence of the usual cables from China because of the celebration of the Chinese new year has made for a stronger market. Chinese metal for all positions is quoted at 9.75c., duty paid, New York.

Non-Ferrous Metals at Chicago

CHICAGO, Feb. 5.—All non-ferrous metals are in good demand in this district and prices are strong. Quotations for copper and tin are higher. The old metal market is strong.

Prices, per lb., in carload lots: Lake copper, 17.37½c.; tin, 50.10c.; lead, 6.60c.; zinc, 6.45c.; in less-than-carload lots: antimony, 10.50c. On old metals we quote copper wire, crucible shapes and copper clips, 13.50c.; copper bottoms, 12c.; red brass, 12c.; yellow brass, 9c.; lead pipe, 5.50c.; zinc, 3.50c.; pewter, No. 1, 27.50c.; tin foil, 27.50c.; block tin, 40c.; aluminum, 12.75c.; all being dealers' prices for less-than-carload lots.

Railroad Equipment

Orders for 3900 Freight Cars—Inquiries for 700

FREIGHT car orders placed during the last week totaled nearly 3900, including 2000 for the Chicago & North Western and 1400 for the Pere Marquette. Outstanding among the new inquiries is one for 500 gondola cars for the Northern Pacific. Details of the week's business follow:

Chicago & North Western has ordered 500 box and 500 gondola cars from Pullman Car & Mfg. Corporation, 500 box cars from General American Car Co. and 500 gondolas from Standard Steel Car Co. This company will soon enter the market for five horse cars, 24 suburban coaches, four baggage-smokers, one cafe and five combination passenger and baggage cars.

Fort Worth & Denver City is inquiring for 100 50-ton gondola cars.

Erie Railroad has ordered five 120-ton flat cars from Standard Steel Car Co.

Chesapeake & Ohio has placed orders for 125 caboose cars at the shops of the Hocking Valley, Logan, Ohio, and is expected to inquire for 12 express cars for its own use and three baggage and mail cars for Hocking Valley. Hocking Valley is also inquiring for 107 50-ton flat cars.

Northern Pacific is inquiring for 500 gondola cars.

Atchison, Topeka & Santa Fe has ordered 21 gas-electric rail motor cars from Pullman Car & Mfg. Corporation. This road is still inquiring for 200 flat cars.

Louisville & Nashville has ordered four passenger coaches, four coach smoking cars and four passenger and baggage cars from American Car & Foundry Co.

Tidewater Oil Co. has ordered 118 tank cars from American Car & Foundry Co.

Elgin, Joliet & Eastern will build 75 flat car bodies at its own shops.

American Rolling Mill Co., Middletown, Ohio, is inquiring for two oil-electric switching locomotives.

Chicago, Rock Island & Pacific has ordered 250 ballast cars from Standard Steel Car Co.

Pere Marquette has ordered 1000 box cars from Pressed Steel Car Co., and 400 gondola cars from Magor Car Co.

Chicago, Milwaukee, St. Paul & Pacific will buy 14 4-6-4 and one 4-8-4 locomotives.

Reinforcing Steel

Chicago Bridge Will Take 1300 Tons

NEW projects which have come out for bids in the last week call for more than 3800 tons, including 1300 tons for a bridge at Chicago. Awards totaled 2300 tons, the lettings having been as follows:

BROOKLYN, 450 tons, incinerator plant for Brooklyn Ash Removal Co., Inc., reported last week to unnamed fabricator, to Igoe Brothers.

MINEOLA, N. Y., 100 tons, sewer work, to Truscon Steel Co.

PITTSBURGH, 200 tons, Pierpoint Motor Co. extension, to Metzger-Richardson Co.

CLEVELAND, 175 tons, Cleveland Union Terminals Co., to Bourne-Fuller Co.

CHICAGO, 200 tons, building at 558 West Randolph Street, to unnamed bidder.

CHICAGO, 425 tons, apartment building at Glenlake Avenue and Sheridan Road, to Inland Steel Co.

CHICAGO, 200 tons, apartment building, awarded by Avery Brundage, general contractor, to Inland Steel Co.

MINNEAPOLIS, 1500 tons, Northwest Bank building, to Calumet Steel Co.; previously reported to an unnamed bidder.

ST. LOUIS, 250 tons; 150 tons for addition to plant of Wagner Electric Corporation, and 100 tons for apartment house at DeBaliviere and Delmar Boulevards, to Laclede Steel Co.

PHOENIX, ARIZ., 400 tons, Stewart Mountain Dam, to Allison Steel Mfg. Co.

LOS ANGELES, 150 tons, warehouse at Hyperion and Sunset Boulevards, to unnamed interest.

LOS ANGELES, 225 tons, apartment building, Pellissier Square, to unnamed bidder.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

BROOKLYN, 100 tons, tunnel for Bush Terminal Co.

NEW YORK, 350 tons, subway section in Queens; Philip J. Cogan, general contractor.

BEACON, N. Y., 420 tons, building for National Biscuit Co.; John W. Cowper Co., Buffalo, low bidder on general contract.

JERSEY CITY, 200 tons, eight-story ramp garage; bids Feb. 16.

CLEVELAND, 160 tons for Cleveland Union Terminals Co.

CHICAGO, 200 tons, building for American Bankers Insurance Co.; Childs & Smith, architects.

CHICAGO, 200 tons, McChesney Building; Lundoff-Bicknell Co., general contractors.

CHICAGO, 400 tons, Board of Trade Building; Hegeman-Harris Co., general contractors.

CHICAGO, 1300 tons, Damon Avenue bridge; Great Lakes Dredge & Dock Co., general contractors.

EVANSTON, 170 tons, Main township high school; Ralph Sollitt, general contractor.

MILWAUKEE, 345 tons, requirements for the United States district engineer; bids close Feb. 14.

Dupont Stock Acquisitions Reviewed

Report on Purchases of Steel and Motors Shares Brings Out Sharp Criticism—Licensing Law Remote

WASHINGTON, Feb. 5.—The fishing expedition of the Federal Trade Commission into investments of E. I. du Pont de Nemours & Co. in the United States Steel Corporation and the General Motors Corporation does not appear to have resulted in any catch, except a biting dissent from one member of the commission, William E. Humphrey, who, commenting on the report of the commission, made public last Sunday, said its action "is an illuminating illustration of bureaucracy gone insane." Mr. Humphrey explained that the main reason for writing his dissenting opinion is to reassure the business of the country that no such performance will happen again.

It is considered extremely doubtful that the report will accomplish the purpose inspiring the inquiry, which evidently was to influence Congress to pass a licensing law for corporations. Rather, the report appears to have met with such unfavorable reaction that such legislation is more remote than ever, and it never was seriously considered.

The report contains nothing of importance that was not already known and, as it frankly points out, there was no complaint made to the commission to call for its resolution of inquiry. The resolution was adopted July 29, 1927, with a bare majority, or three of the five members present. Two of these, Abram F. Myers and James F. Nugent, are no longer on the commission. The other, C. W. Hunt, is still a member of the commission.

"No violation of the law was alleged," Mr. Humphrey explained in his dissenting opinion. "That the respondents were conducting their business lawfully is admitted. This is the only case in the history of the country where the Government, when no wrong-doing was alleged, put a concern to the cost, the annoyance and the discredit of an investigation. I doubt if a parallel case can be furnished in any civilized country. If obeying the law is no protection from such outrageous usurpation of power by a creature of Congress, then it means that the citizen is helpless, and the end of free government."

Basis of Inquiry

The commission based its inquiry on what it termed an apparent community of interest among the Du Pont-General Motors-Steel Corporation interests, and took action under Section 6 of the Clayton anti-trust law authorizing the commission to inquire into the organization, business, conduct, practice and management of corporations. It was alleged that the study was purely of an economic character. The large stockholdings of the Du Pont company in General Motors, and its purchase of 114,000 shares of Steel Corporation stock, apparently led the commission to see visions of a merger of these three large industrial interests and to give impetus to the then current discussion confined chiefly to publicists and economists, of the need for a Federal licensing law for corporations.

The only approach to a recommendation in the report is the statement that the net results of the financial relationship existing between the Du Pont company and General Motors is to assure an outlet for a considerable portion of several of the company's most important products at little or no selling cost. The report wound up with the cryptic statement that "This, however, is only one reason for this financial relationship, and not necessarily the most important one." The reason specifically assigned, finding an outlet for the company's product, was admittedly the one intended by the company as a good and altogether legitimate business matter, so that the report on this score is not revealing. It was found that the relationship between Du Pont and the United States Steel Corporation was minor, in contrast with reports that Du Pont was trying to gain control of the Steel Corporation. It was brought out also that neither General Motors nor the Steel Corporation held stock in the Du Pont company. Mr. Humphrey said that the one specific purpose of the report is to demonstrate that the Government should have "supervision over corporations and the right to say how and where they shall dispose of surplus earnings," the quoted words being taken from an interview given by the author of the resolution at the time it was adopted. It is said Mr. Myers was the author.

"The fact that to accomplish such supervision, even if advisable, would take more employees than there are now on the Government payroll, did not in the least shake the belief of those who voted for this resolution in the desirability of the plan," Mr. Humphrey declared.

In the course of his concluding remarks, Commissioner Humphrey, reassuring business that no "such performance will happen again," said:

"This action is without precedent. No one like it will follow. It is beyond all reasonable probability that the President will ever appoint, and the Senate confirm, a majority of the commission who hold such irrational opinions of the powers and duties of the commission. The history of this case furnishes a most instructive instance of how men clothed with a little brief authority become drunk with their own greatness and lose all sense of proportion, and become entirely blinded to the rights of the citizen."

Bethlehem Offers Preferred Stock to Employees

The Bethlehem Steel Corporation has announced its sixth annual offering of stock to employees, the price this year of the 7 per cent cumulative preferred stock of the corporation to be $122 per share. Any employee in the service of the company on Feb. 1 may apply for stock at the rate of one share for each $400 of annual earnings. Payments for stock may be made in cash or in instalments at the rate of $4 per share monthly, $2 per share semi-monthly or $1 per share weekly, extending over a period of 28 months. For stock being paid for by instalments, payroll deductions will be made on each payday, beginning with the first pay received in April, and interest at the rate of 5 per cent will be charged on the unpaid monthly balances.

Dividends now being paid quarterly at the rate of $7 per year will be credited to the employee on his stock and, in addition, special benefits amounting to $1 per share for the first year, $2 for the second, $3 for the third, $4 for the fourth and $5 for the fifth year in which the employee holds his stock will be paid or credited to him. After payment of the stock has been completed, dividends and special benefits will be paid directly by check to the employee.

Since the Bethlehem stock ownership plan was inaugurated in 1924 more than 30,000 employees, or half the total number, have become stockholders in the corporation and each year the number of employees applying for shares has increased. During the five-year period Bethlehem employees have saved approximately $14,500,000 and have been paid dividends and special benefits amounting to $3,257,506.

Blast Furnace at Ashland, Ky., to Be Remodeled

The American Rolling Mill Co., Middletown, Ohio, has retained the Freyn Engineering Co., Chicago, for the remodeling of its Norton blast furnace at Ashland, Ky. The present stack will be completely revamped and is expected to be ready to go in about the middle of May.

"The new American wishes concerning tariff raising and enforced marking of import goods," says the Cologne *Gazette*, "are felt here to be pin-prick politics, especially as imports of German iron into the United States are negligible, whereas American exports of automobiles into Germany are important. Germany wishes," continues that newspaper, "in conformity with the Internationale Rohstahlgemeinschaft, to work together with America but expects on the other side mutual good will."

PERSONAL

WALTER R. BREELER, research metallurgist for the Atlas Steel Co., Dunkirk, N. Y., has joined the Whitman Barnes-Detroit Corporation, Detroit, and will be in charge of the chemical and metallurgical departments. He was graduated in chemical engineering from the Case School of Applied Science in 1921 and his first employment was with Thompson Products, Inc., Cleveland, as chief chemist and assistant metallurgist. In 1924 he went with the Whitman Barnes Mfg. Co., Akron, Ohio, as metallurgist and chemist, remaining in that position

WALTER R. BREELER

until early in 1926 when he went with the Atlas organization. In his recent capacity he has specialized in the study of heat resisting, stainless and tool steels. He collaborated with FRANK B. LOUNSBERRY, vice-president of the Atlas company, in the preparation of a paper on "An Investigation of the Physical Properties of Certain Chromium-Aluminum Steels," presented at the last meeting of the American Society for Steel Treating.

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F. E. MOSKOVICS, for the last four years president of the Stutz Motor Car Co. of America, Indianapolis, has resigned, and has been succeeded by COL. E. S. GORRELL, recently vice-president. E. B. JACKSON, who has also been a vice-president of the company, has been named chairman of the board, succeeding E. V. R. THAYER.

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HERBERT C. BEIK has been appointed district engineer and sales representative in eastern New York and Long Island, northern New Jersey, Connecticut, Rhode Island, Massachusetts, New Hampshire and Maine for the Despatch Oven Co., Minneapolis. He will represent the company in the industrial field only, concerning himself with japanning and enameling ovens, special drying equipment, core and mold ovens and electric salt and oil baths, including electric coil and armature baking equipment. His headquarters will be at 21 East Fortieth Street, New York.

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RENO V. JONES has been appointed district sales manager of Republic Iron & Steel Co. at Buffalo, succeeding ALLAN HILLS, who has moved to Toronto, Ont., and will cover the Canadian territory.

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MURRAY N. BILLINGS, traffic manager of the Illinois Steel Co., has been appointed Western traffic manager for the Universal Portland Cement Co., 208 South LaSalle Street, Chicago, and will serve both these companies which are subsidiaries of the United States Steel Corporation. He succeeds F. T. BENTLEY, who has been associated with Steel Corporation subsidiaries for 35 years. Mr. Bentley retired from active service last year but will continue in a consulting capacity. FRANK E. GUY, who has been assistant Eastern traffic manager of the Universal company since 1912, has been made Eastern traffic manager. He succeeds L. C. BIHLER, who was also traffic manager of the Carnegie Steel Co. and who has been made assistant to the president and general traffic manager of the company. Mr. Guy's headquarters will be in Pittsburgh.

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JOHN DALZELL has been appointed purchasing agent of the Heppenstall Forge & Knife Co., Pittsburgh, succeeding V. I. Cox, who has resigned.

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C. H. STEWART, who was mentioned last week as having been made assistant manager of the New York office of the Pittsburgh Crucible Steel Co., has been appointed to a similar position with the Pittsburgh Steel Co., Pittsburgh, instead of the Crucible company, and has recently been New England manager for the Pittsburgh Steel Co. J. WAINWRIGHT JANES has succeeded him in New England.

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CHARLES E. BEESON, who has been acting president of the Pittsburgh Gage & Supply Co., Pittsburgh, since the death of William Rodgers, has been elected president. He also has been elected to the presidency of the Gainaday Electric Co., an affiliated company. Mr. Beeson is a director of the Pittsburgh Steel Co., and also vice-president in charge of operations of its subsidiary, the Monessen Coal & Coke Co.

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WILLIAM H. MYER has been appointed assistant chief of the Iron and Steel Division, Bureau of Foreign and Domestic Commerce, Department of Commerce, succeeding WILSON K. RAY, manager of the Bureau's branch in Pittsburgh. Mr. Myer, who has assumed his new duties, formerly was associated with the exporting firm of Frazar & Co., New York, and previously was in the testing department of the General Electric Co. at Schenectady, N. Y., and Pittsfield, Mass. He was graduated from Harvard University in 1911.

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JAMES THOMPSON, chief engineer of the Hubbard Steel Foundry Co., East Chicago, Ind., and chairman of the local sanitation committee, has recently been appointed chief engineer for the East Chicago Sanitary District.

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CHARLES O. HADLY, vice-president in charge of sales for the Alan Wood Iron & Steel Co., Philadelphia, now the Alan Wood Co., has severed a connection with the company extend-

CHARLES O. HADLY

ing over the past 20 years. After a few months' vacation he expects to engage in business for himself. His initial experience in the steel business was with the W. Dewees Wood Co., McKeesport, Pa., for about 17 years. When that company was acquired by the American Sheet Steel Co., later the American Sheet & Tin Plate Co., he continued in the new organization for four years, going to the Alan Wood Iron & Steel Co. about 1908. Other changes in the Alan Wood organization include the resignation of ALAN D. WOOD, director of purchases of the company, and J. C. MENDENHALL, of the purchasing department.

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JOHN C. SPENCE, formerly works manager of the Machine Division, Norton Co., Worcester, Mass., has bought an interest in the Universal Boring Machine Co., Hudson, Mass., and will be works manager of the latter company.

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WILLIAM J. CORBETT has resigned as secretary-manager of the Steel Founders' Society of America to become assistant to the president of the Fort Pitt Steel Casting Co., McKeesport, Pa., maker of high grade carbon and alloy steel castings by the electric furnace process. He was graduated from the Carnegie Institute of Technology in 1914 with the

Bachelor of Science in Mining Engineering and later received the professional degree of Metallurgical Engineer. His first employment was as a special apprentice at the Alliance, Ohio, works of the American Steel Foundries. He was later transferred to that company's Chester, Pa., plant and was serving as production engineer when he resigned in 1917 to enter the army. At the close of the war he was placed in charge of the manufacture of castings at the Watertown Arsenal, Watertown, Mass., leaving that work in 1919 to become assistant to the vice-president of the American Steel Foundries at Chicago. In 1923 he became industrial engineer for the Electric Steel Founders' Research Group, which is composed of five leading electric steel foundries and engages in cooperative research work in the manufacture of steel castings. He became identified with the Steel Founders' Society of America when that organization's activities were enlarged in 1925 and has been secretary-manager since that time. He has been active in the affairs of the American Foundrymen's Association and the American Society for Testing Materials, having served on a number of committees of both organizations.

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E. S. FICKES, vice-president in charge of engineering for the Aluminum Co. of America, Pittsburgh, has been elected a director of that company, and W. C. NEILSON, who has been in charge of the company's bauxite interests, with headquarters at Philadelphia, has been made a vice-president.

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F. J. GRIFFITHS, chairman Central Alloy Steel Corporation, Massillon, Ohio, sailed on Feb. 2 for Europe, where he will spend two months visiting leading steel works in France and Germany. He will spend considerable time at the Krupp works at Essen, Germany, studying new developments in connection with nitralloy and nirosta steels, for the manufacture of which Central Alloy Corporation holds licenses in the United States.

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JAMES LESTER GOODWIN, president of the Whitlock Coil Pipe Co., Hartford, Conn., has been made a director of the Southern New England Telephone Co.

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GEORGE MARTENS, who has been manager of the New York office of the Otis Elevator Co., will be manager of the new territorial office which that company is to establish at Buffalo, to have under its jurisdiction the company's offices at Schenectady, Rochester and Syracuse, N. Y.; Pittsburgh; Huntington, W. Va., and Cleveland. THOMAS F. MCKEAN, JR., now assistant service manager for the company at Boston and previously manager of the Portland, Me., unit, will be service manager. Other members of the staff will be: L. E. KIMBALL, sales engineer; R. H. CUNAT, accounts, and E. J. STAFFORD, construction engineer.

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C. W. YERGER, Eastern district manager for Cutler-Hammer, Inc., Milwaukee, has been appointed sales manager of the Hanson-Van Winkle-Munning Co., Matawan, N. J., maker of electroplating and polishing equipment and supplies, and will assume his new duties on March 4. He will succeed E. N. BOICE, secretary of the company, who will relinquish his sales activities in order to give more time to executive duties. Mr. Yerger has been identified with the Cutler-Hammer company since 1908, and before becoming Eastern manager, he was successively engineer, Pacific Coast representative and manager of the Cincinnati, Washington and Boston offices.

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JOHN H. WARNE, formerly general manager William B. Pollock Co., Youngstown, has been elected president of the Standard Boiler & Plate Iron Co., Niles, Ohio. Mr. Warne and associates have obtained a controlling interest in the Niles company.

JAMES A. CAMPBELL, president Youngstown Sheet & Tube Co., leaves Youngstown this week for Florida, where he expects to visit President-elect Hoover. He will return to his desk in Youngstown about April 1.

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W. P. ARMS and J. S. SPROTT have retired from the board of directors of the General Fireproofing Co., Youngstown, and AVERY C. ADAMS, assistant to the president of the company; C. F. SMITH, and NORMAN EMERY have been elected members. Membership on the board has been increased to nine.

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E. M. WEINFURTNER, secretary and treasurer of Ashland Fire Brick Co., Ashland, Ky., has been elected first vice-president and chairman of the executive committee of the recently organized North American Refractories Co., which is made up of six companies including the Ashland organization. E. H. GARTRELL, now president of the Ashland company, is to be vice-president in charge of the Ashland division of the North American company.

Three Industries to Try Self Government

Commission Rescinds Trade Practice Action for Millwork Manufacturers Because of Current Price Lists

WASHINGTON, Feb. 5.—Announcement was made today by the Federal Trade Commission that trade practice conferences will be held in the near future for the adoption of rules governing the reinforcing steel bar, metal lath and range boiler industries. The time and place of the conferences will be determined upon soon. Chairman Edgar A. McCulloch will preside at the concrete reinforcing steel bar conference, Commissioner W. E. Humphrey at the metal lath conference and Commissioner G. S. Ferguson, Jr., at the range boiler conference.

Simultaneously, the commission announced that it has reconsidered and rescinded its action of June 29, 1928, in receiving a rule of the trade practice conference of the millwork industry regarding distribution of price lists. The commission has directed that "the commission, in the present state of law, cannot receive a resolution of the industry for the circulation of prices which is not confined to past transactions." The rule was of the so-called group two class of the trade practice conference, received with neither the approval nor disapproval of the commission, and recorded approval of the industry of the practice of distributing current price lists. The commission evidently felt it had trod on dangerous ground in receiving such a rule, in as much as Supreme Court decisions have approved only the circulation of prices relating to past rather than current transactions.

Steel Corporation Pension Fund Disbursements

The annual report of United States Steel and Carnegie Pension Fund shows that $3,488,488 was distributed as pensions to retired employees of the United States Steel Corporation and its subsidiary companies in 1928. Retired employees of the Carnegie Steel Co. were paid $885,292, while disbursements to former active men of the other subsidiary companies were: American Steel & Wire Co., $671,340; American Sheet & Tin Plate Co., $441,926; National Tube Co., $383,321; H. C. Frick Coke Co., $305,651; Illinois Steel Co., $179,766; American Bridge Co., $156,139; Oliver Iron Mining Co., $128,726; Duluth & Iron Range Railroad Co., $51,921; Tennessee Coal, Iron & Railroad Co., $48,321; Elgin, Joliet & Eastern Railway Co., $44,014; Bessemer & Lake Erie Railroad Co., $41,167.

In 1928, 1195 employees were added to the pension roll and 583 were removed from the list, the total at the close of the year having been 7000. The average age of the 1195 employees retired in 1928 was 63.86 years; their average period of service was 34.10 years, and the average monthly pension, $53.55. The total amount paid in pensions since the inauguration of the pension plan on Jan. 1, 1911, is $22,325,423.

OBITUARY

B. T. BECHTEL, Chicago district sales manager for the Youngstown Sheet & Tube Co., died suddenly on Feb. 1. He had become ill two weeks ago, and, after a rest of 10 days, had returned to his office to make final arrangements for an extended vacation in California. He was born at Omaha, Neb., on Dec. 17, 1879, and went to Chicago as a young man. There he obtained work in the general office of the Chicago & Western Indiana Railroad. In 1903 he joined the sales organization of the Marks Mfg. Co., which later became known as the Steel & Tube Co. of America. Soon after he started in sales work he was transferred to Pittsburgh and placed in charge of that office by the Marks company. He was later returned to Chicago as general sales manager for the Steel & Tube company. When the company was merged with the Youngstown Sheet & Tube Co. in July, 1923, Mr. Bechtel was retained as manager of sales in charge of the Chicago office.

B. T. BECHTEL

W. L. HOFFMAN

S. W. MILLER

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WILLIAM L. HOFFMAN, long identified with the steel trade in the Philadelphia district, died Feb. 1, at his home in Germantown, Pa. He was 50 years of age and had been in ill health for more than a year before his death, but had continued active in his own organization, William L. Hoffman & Co., Philadelphia agents for the Empire Steel Corporation, Mansfield, Ohio. His first connection with the steel business was as representative in the Philadelphia district of the Republic Iron & Steel Co. and later the Tennessee Coal, Iron & Railroad Co., on sales of pig iron. When the Tennessee company was acquired by the United States Steel Corporation in 1907, he continued to handle sales of Tennessee iron in the Carnegie Steel Co. organization, but a year later left to join the sales organization of Crocker Brothers in the New York district. The following year he became identified with Hickman, Williams & Co., as Philadelphia district representative on pig iron, and two years later, was appointed Philadelphia district manager of the Brier Hill Steel Co., Youngstown. He continued in this capacity for 10 years until, in 1923, that company was acquired by the Youngstown Sheet & Tube Co. He then established his own company, which represented the Mansfield Sheet & Tin Plate Co., Mansfield, Ohio, and continued as representative of the Empire Steel Corporation, when that company absorbed the Sheet & Tin Plate company in 1927. He was one of the founders of the Steel Club of Philadelphia in 1919 and was its first president.

—

SAMUEL WYLIE MILLER, since 1921 consulting engineer for the Union Carbide & Carbon Research Laboratories, Long Island City, N. Y., and a former president of the American Welding Society, died on Feb. 3, at his home in Hollis, N. Y., aged 62 years. He was born in New York and was graduated from Stevens Institute of Technology, Hoboken, N. J., in 1887. He was first employed by the Pennsylvania Railroad at Indianapolis and Logansport, Ind., and Columbus, Ohio, but later went with the American Locomotive Co., serving in its plants at Dunkirk, N. Y., and Providence, R. I. He subsequently founded the Rochester Welding Works, Rochester, N. Y., remaining with that organization until 1921. Mr. Miller was one of the first to visualize the potentialities of oxy-acetylene welding and had made a special study of the process, developing and widening its applications. He had long been active in the affairs of the American Welding Society and was also a member of the American Society of Mechanical Engineers, the American Society of Mining and Metallurgical Engineers, the American Society for Steel Treating, the Institute of Metals and the Iron and Steel Institute (British).

—

GEORGE SPRINGER THOMPSON, head of the Thompson Purchasing Co., Paris, France, which for some years has represented a number of American importers of European steel products, died on Jan. 13 at the American Hospital, Neuilly-sur-Seine, France. He was for many years connected with American steel companies in this country before going abroad during the war. After the armistice he decided to remain in France and engaged in business as a purchasing agent of steel for export. The remains were sent to the United States for interment at Hockessin, Del.

—

CHARLES DEERE VELIE, vice-president of the Deere & Webber Co., Minneapolis, with which he had been associated in an executive capacity for 30 years, died recently at his home in Minneapolis, aged 67 years. He had been associated with the Deere & Co. interests for nearly 50 years.

—

GEORGE R. KELLY, president and general manager of the R. A. Kelly Co., Xenia, Ohio, manufacturer of shapers, died on Jan. 24, following a protracted illness. He was 58 years of age and for many years had been head of the company, which was founded by his father, R. A. Kelly. The company manufactures rope and twine, but also has a plant exclusively devoted to building crank shapers.

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R. J. KVALHEIM, general superintendent of the Crown Iron Works, Minneapolis, died on Jan. 15, aged 40 years.

—

ALEXANDER T. BROWN, president of the Brown-Lipe Gear Co., Syracuse, N. Y., and well known for his inventions, died at his home in Syracuse on Jan. 31, aged 75 years. He was also identified with the Globe Forge & Foundry Co., the H. H. Franklin Mfg. Co., and many other leading Syracuse industries.

—

HERBERT LANGDON WATERMAN, formerly associated with the Carnegie Steel Co., and for 17 years New York representative of the Cambria Steel Co., Johnstown, Pa., died on Jan. 22, at the Framingham, Mass., Union Hospital, aged 72 years.

The Falk Corporation, Milwaukee, is constructing a 25-ton open-hearth furnace after designs of the Freyn Engineering Co., Chicago.

Where Steel Exports Went in Nineteen-Twenty-Eight

Canada Took 607,083 Tons of Nine Leading Items—Japan Retains Second Position with 151,772 Tons, Followed by Mexico, 51,566 Tons; Argentina, 46,889 Tons; Brazil, 44,345 Tons; Chile, 39,403 Tons

Exports from United States, by Countries of Destination

(In Gross Tons)

	Steel Plates				Galvanized Sheets				Black Steel Sheets			
	December		12 Months Ended December		December		12 Months Ended December		December		12 Months Ended December	
	1928	1927	1928	1927	1928	1927	1928	1927	1928	1927	1928	1927
Total	*18,736*	*15,444*	*166,269*	*139,632*	*13,759*	*9,574*	*152,176*	*152,181*	*12,759*	*8,181*	*179,329*	*152,525*
Canada	15,952	12,028	140,876	112,147	2,095	635	32,039	31,072	7,260	2,825	84,495	62,250
Japan	....	943	1,619	2,148	1,629	171	4,361	3,625	2,207	3,296	62,548	61,849
Cuba	47	82	1,129	846	565	425	5,883	10,945	76	114	1,910	1,207
Philippine Islands	....	370	3,152	2,082	2,216	1,755	22,131	19,004	191	41	3,006	2,739
Mexico	26	16	1,101	815	715	531	8,544	8,254	323	68	2,685	1,652
Argentina	....	....	....	....	458	615	7,461	9,207	17	57	1,494	1,882
Chile	....	....	....	....	....	....	....	....	22	843	2,449	5,910
Colombia	....	....	....	....	607	767	8,031	8,940	10	34	389	595

	Steel Rails				Barbed Wire				Plain and Galvanized Wire			
	December		12 Months Ended December		December		12 Months Ended December		December		12 Months Ended December	
	1928	1927	1928	1927	1928	1927	1928	1927	1928	1927	1928	1927
Total	*12,114*	*15,717*	*189,461*	*177,586*	*5,371*	*4,128*	*74,341*	*52,393*	*3,522*	*2,891*	*46,160*	*35,435*
Canada	624	1,714	25,369	29,214	468	6	3,677	3,580	1,007	1,038	15,639	14,453
Japan	3,460	914	18,344	29,474	....	....	....	....	163	251	1,677	702
Cuba	2	402	4,239	18,619	30	248	4,590	4,107	55	43	997	1,171
Philippine Islands	1,203	....	5,476	5,284	268	261	2,865	2,957	81	11	351	591
Mexico	417	1,031	6,597	7,744	442	580	6,006	4,407	204	131	2,213	3,701
Argentina	....	....	....	....	1,276	912	14,621	6,810	416	522	10,626	6,971
Chile	1,984	301	28,281	4,241	....	32	....	944	....	....	....	....
Colombia	542	2,340	10,582	3,769	542	377	4,311	4,110	....	....	....	....
Brazil	1,831	776	21,547	22,642	1,022	392	14,853	9,109	268	154	1,405	415

	Tin Plate				Steel Bars				Heavy Plain Structural Material			
	December		12 Months Ended December		December		12 Months Ended December		December		12 Months Ended December	
	1928	1927	1928	1927	1928	1927	1928	1927	1928	1927	1928	1927
Total	*17,027*	*15,856*	*249,362*	*253,890*	*14,937*	*7,983*	*158,579*	*111,126*	*17,086*	*14,310*	*202,780*	*148,176*
Canada	4,394	1,827	48,283	41,918	9,155	4,453	101,843	65,399	14,370	11,730	171,399	121,514
Japan	4,675	5,743	55,991	54,685	1,051	203	6,522	1,597	300	531	2,387	4,584
Cuba	320	248	4,073	3,761	383	234	4,387	3,170	88	293	5,282	7,473
Mexico	1,002	894	13,921	12,177	51	51	742	845	57	54	1,177	497
Argentina	1,697	1,711	22,460	33,415	140	7	853	355	594	....	966	329
Chile	560	502	4,823	5,805	....	123	....	191	132	198	3,850	2,810
Brazil	201	218	7,945	9,729	....	....	....	....	....	....	....	....
China	2,337	....	22,210	8,949	....	....	....	....	....	....	....	....
British India	8	....	7,823	8,918	....	....	....	....	....	....	....	....
United Kingdom	....	....	....	....	1,266	1,380	17,831	17,952	....	....	....	....
Italy	275	....	5,165	14,291	....	....	....	....	....	....	....	....

Destination of Iron and Steel Exports from the United States

(In Gross Tons)

Countries of Destination	December, 1928	January through December 1928	1927
North and Central America and West Indies	*107,369*	*1,419,750*	*1,089,729*
Canada and Newfoundland	87,581	1,180,302	834,025
Cuba	5,129	65,216	92,486
Mexico	7,265	83,094	81,747
Guatemala	406	8,085	6,124
Panama	1,393	17,062	18,880
Salvador	183	3,228	7,139
British West Indies	419	7,652	12,384
Other West Indies	4,008	39,716	23,726
Other Central America	985	15,395	13,218
South America	*33,276*	*437,019*	*349,443*
Argentina	6,567	98,381	82,380
Brazil	5,467	83,900	70,633
Chile	4,129	67,979	44,641
Colombia	4,086	63,709	59,080
Peru	2,109	26,541	32,207
Uruguay	424	8,762	11,393
Venezuela	9,736	82,569	45,667
Other South America	758	5,178	3,442
Europe	*20,670*	*283,315*	*197,309*
Belgium	767	14,079	6,609
France	3,167	9,122	4,586
Greece	15	2,834	4,506
Italy	3,770	89,976	41,833
Netherlands	211	2,332	12,099
Soviet Russia	31	2,787	8,099
United Kingdom	4,264	54,069	66,915
Other Europe	8,445	108,116	52,662
Far East	*58,571*	*708,710*	*526,709*
British Malaya	228	6,402	8,444
China	4,764	92,827	53,843
Dutch East Indies	3,162	40,726	35,258
India and Ceylon	841	25,509	28,497
Japan and Chosen	37,465	407,374	278,206
Kwangtung	181	14,021	19,293
Philippine Islands	6,936	84,229	63,343
Australia	4,408	19,633	26,670
New Zealand	303	2,305	1,291
Other Asia and Far East	283	15,684	11,864
Africa	*1,924*	*14,203*	*19,901*
British South Africa	1,466	7,422	10,403
Egypt	124	3,788	4,556
Mozambique	234	1,399	3,827
Other Africa	100	1,594	1,115
Total	221,810	2,862,997	2,183,091

European Buyers Offer Delivery Bonuses

Shipbuilding Increase Aids Continental Mills—Export Prices Advancing—German Copper Users to Oppose High Prices

(*By Cable*)

LONDON, ENGLAND, Feb. 4.

CONDITIONS are improving slightly and progress is likely to continue with a fair volume of inquiries from home consumers and the colonies. Continental competition with British material has considerably lessened lately because of the advanced prices asked by Continental makers, many of whom are well booked and unable to offer early delivery.

Tin plate is quiet, but inquiry is improving and increased business is anticipated soon. Galvanized sheets are active although no large quantities are involved. India is inquiring for galvanized and Japan has bought a few minor lots of thin gage black sheets.

The Balfour Committee on Trade and Industry, appointed in 1924, has completed its task and a report is expected this month. It is not anticipated that the Government will take further action on iron and steel until after its publication, despite continued pressure by advocates of protection.

The Indian Railways has placed orders for 60 heavy boiler locomotives with the Vulcan Foundry, Ltd., Newton-le-Willows, Lancashire, although Continental makers were competing.

The Clyde Shipbuilding output in January was five vessels of 33,000 tons.

The Continental market is firm but business from British buyers is small. A strong demand for semi-finished steel, particularly billets and sheet bars is reported, as British mills are well sold ahead and there is some small business in merchant lots. The West European Pig Iron sales office is expected to announce new export prices shortly. Meanwhile advanced prices are being asked by sellers.

Belgian Steel Prices Strong

Semi-Finished Steel Scarce—Buyers Offer Advances for Early Delivery—Sheet Prices Firmer

ANTWERP, BELGIUM, Jan. 19.—A good volume of business is being booked by steel mills, although the past week has shown a slight decline in activity. Prices, however, are firm and on some products have advanced. Deliveries are still extended, most mills being unable to offer shipments before the end of March. Among large tonnage orders booked by Belgian makers are several sizable rail contracts. The German domestic market, which was expected to be less active than last year, continues to absorb a large part of the present German output of steel as a result of the shortage created by the lockout in the Ruhr last November.

Semi-finished steel prices are decidedly irregular, with little material available for early delivery and buyers in some instances offering bonuses to obtain necessary requirements. Most mills are refusing to quote on blooms, and billets are obtainable only at continually advancing quotations. Sheet bars are also increasing in price, although few sales are reported because of lack of interest on the part of sheet mills. Billets of Thomas quality are quoted at £5 2s. 6d. ($24.86) and sales have been made at £5 2s. ($24.73) per ton, but it is doubted that the latter price could be repeated on a purchase today. Sheet bars are about £5 2s. ($24.73) per ton for normal specifications.

Producers of finished steel products have enough orders to occupy them for the next two months, and certain mills have withdrawn from the market temporarily. Exporters have placed practically all the export orders that they had been withholding to obtain lower prices and, with the market still showing an advancing tendency, are in some cases seeking to accumulate a surplus of certain standard products for which they as yet have no orders.

Steel bar prices have advanced con-

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works with American equivalent figured at $4.85 per £ as follows:

Durham coke, del'd	£0	17	3/4	s.				$4.36	
Bilbao Rubio ore*	1	2		to £1	2	1/2	s.	5.34 to	$5.46
Cleveland No. 1 foundry	3	8	1/2	to 3	9	1/2		16.61 to	16.85
Cleveland No. 3 foundry	3	6						16.00	
Cleveland No. 4 foundry	3	5						15.76	
Cleveland No. 4 forge	3	4	1/2					15.64	
Cleveland basic (nom.)	3	5						15.76	
East Coast mixed	3	11						17.22	
East Coast hematite	3	11	1/2					17.34	
Rails, 60 lb. and up	7	15		to 8	5			37.59 to	40.01
Billets	6	5		to 6	10			30.31 to	31.53
Ferromanganese	13	15						66.69	
Ferromanganese (export)	14	0						67.90	
Sheet and tin plate bars, Welsh	6	0						29.10	
Tin plate, base box	0	18		to 0	18	1/4		4.37 to	4.43
Black sheets, Japanese specifications	13	7	1/2					64.87	
								C. per Lb.	
Ship plates	7	12	1/2	to 8	2	1/2		1.66 to	1.76
Boiler plates	9	0		to 10	10			1.95 to	2.27
Tees	8	2	1/2	to 8	12	1/2		1.76 to	1.86
Channels	7	7	1/2	to 7	17	1/2		1.60 to	1.71
Beams	7	2	1/2	to 7	12	1/2		1.55 to	1.65
Round bars, 3/4 to 3 in.	7	15		to 8	5			1.67 to	1.78
Steel hoops	9	0		to 10	0			1.95 to	2.16
Black sheets, 24 gage	10	0						2.16	
Galv. sheets, 24 gage	13	12	1/2	to 13	15			2.95 to	2.98
Cold rolled steel strip, 20 gage (nom.)	16	0						3.47	

*Exship. Tees, nominal.
(a) Nominal.

Continental Prices All F.O.B. Channel Ports

(Per Metric Ton)

Foundry pig iron (a):							
Belgium	£3	6s.	to £3	10s.	$16.00 to	$16.97	
France	3	6	to 3	10	16.00 to	16.97	
Luxemburg	3	6	to 3	10	16.00 to	16.97	
Basic pig iron (a):							
Belgium	3	6			16.00		
France	3	6			16.00		
Luxemburg	3	6			16.00		
Coke	0	18			4.37		
Billets:							
Belgium	5	3	1/2		25.10		
France	5	3	1/2		25.10		
					C. per Lb.		
Merchant bars:							
Belgium	6	4	to 6	6	1.36 to	1.38	
France	6	4	to 6	6	1.36 to	1.38	
Luxemburg	6	4	to 6	6	1.36 to	1.38	
Joists (beams):							
Belgium	5	3	1/2	to 5	5	1.14 to	1.16
France	5	3	1/2	to 5	5	1.14 to	1.16
Luxemburg	5	3	1/2	to 5	5	1.14 to	1.16
Angles:							
Belgium	6	2	1/2		1.33		
1/4-in. plate:							
Belgium (a)	6	12		to 6	13	1.45 to	1.46
Germany (a)	6	12		to 6	13	1.45 to	1.46
3/8-in. ship plate:							
Belgium	6	6		to 6	7	1.38 to	1.39
Luxemburg	6	6		to 6	7	1.38 to	1.39
Sheets, heavy:							
Belgium	6	1			1.31		
Germany	6	1			1.31		

siderably on recent transactions. In some instances bars have brought £6 5s. (1.37c. per lb.) and even £6 6s. per ton (1.38c. per lb.), although the market is nominally £6 4s. to £6 4s. 6d. per ton (1.36c. to 1.37c. per lb.). Even at the advanced prices it is difficult to place large tonnages with a single mill, and most sizable orders are distributed. Beam prices are firm, especially for the smaller specifications, with quotations ranging from £5 2s. to £5 4s. per ton (1.12c. to 1.14c. per lb.). Rods are active, with the current market at £7 2s. 6d. per ton (1.56c. per lb.), and hot-rolled hoops are quotable at £6 5s. per ton (1.38c. per lb.). Even sheet prices, which have shown a tendency toward weakness for some time, are beginning to develop some strength, but no advances have appeared. Competition from British sheets is still reported by mills rolling the lighter gages.

Demand for pig iron continues active, with stocks small and syndicate prices unchanged. Export quotations on No. 3 foundry iron range from £3 6s. to £3 7s. ($16 to $16.24) per ton, f.o.b. Antwerp. The market on Bessemer hematite is still governed by the British price delivered at Belgian ports, which is £3 16s. to £3 17s. ($18.42 to $18.66) per ton, c.i.f. Antwerp.

British Mills Occupied With Shipbuilding Orders

LONDON, ENGLAND, Jan. 18.—The influx of new shipbuilding orders that began last fall has greatly benefited the steel mills. Heavy plate mills have more work on hand than they have had for several months. Mills rolling lighter material also are quite busy, railroad and general construction orders from domestic buyers providing considerable work.

Apart from specialties, such as tin plate and galvanized sheets, of which domestic consumers take only a minor part of the production, export demand for steel has not improved. Colonial governments are placing some orders here, but the ordinary merchant export business is still to a large extent in the hands of Continental producers.

Steel mills claim that they cannot reduce their prices further with the present costs of production and it is unlikely that export trade will return to British mills until their quotations are more competitive.

Pig iron, following improved demand from steel makers, has begun to strengthen, and producers in the Cleveland district report much better business. Their output is restricted, but demand from local steel works absorbs the present production, so that little is left over for sale in the open market. Some furnaces were blown in at the beginning of the year, and preparations are being made to light others.

Competition from Continental producers has virtually ceased, so that the domestic market is practically assured for home producers. Pig iron imports last year totaled only about 100,000 tons, compared with more than 500,000 tons in 1927. More pig iron is being exported to foreign users, Italy having taken considerable quantities of hematite during the past few weeks.

Lloyd's register of shipbuilding for the quarter ended Dec. 31 reflects the improved position of shipyards. Vessels under construction in the United Kingdom at the end of December totaled 1,242,794 tons, an increase from the previous quarter of 153,034 tons, but a decrease from 1927 of 336,919 tons. During the last quarter United Kingdom shipyards started work on 431,758 tons, an increase over the third quarter of almost 190,000 tons, while 245,875 tons of shipping was launched in the last quarter.

Export Markets Active in Germany

(*By Radiogram*)

BERLIN, GERMANY, Feb. 4.

DOMESTIC prices are unchanged for February, but the Ingot Steel Syndicate has increased the price rebates, to exporting manufacturers, on blooms, structural shapes and plates.

Production is active in semi-finished products, bars, wire rods and wire products. Semi-finished departments have orders ahead for seven weeks, and wire rod makers for two months.

Home demand for high-quality steel, especially for automobile manufacturing, is increasing. The export market is more active and prices are firm.

Largest export demand is for billets, bars, bands, plates and tubes. Firmer prices are the result of an understanding with England. Sweden is buying increasing quantities of German shipbuilding materials.

German Copper Users to Combat High Prices

HAMBURG, GERMANY, Jan. 19.—The Federation of German Non-Ferrous Metal Manufacturers has decided to resist the high price policy of Copper Exporters, Inc. According to the federation's estimate copper consumers in Germany will be called upon to spend 55,000,000 m. ($13,090,000) more at the present copper prices than in 1928, when prices were considerably lower. It is understood that methods to be adopted by the federation in opposing the present price level will include greater use of all satisfactory substitutes for copper in combination with other metals, special support of non-members of the Copper Exporters, Inc. and direct negotiations with the exporters' association. Federation members import 230,000 to 250,000 tons of copper annually.

The Vereinigung Deutscher Messingwerke (German brass producers' association) has announced that in the future all buyers of brass ingots and semi-finished material whose total annual purchases are 300 tons or more will receive a bonus of 25 m. ($5.95) per metric ton. This ruling applies to both export and domestic business. Total exports of semi-finished brass products were about 30,000 metric tons in 1928.

Switzerland's Only Blast Furnace Blows In

Switzerland's only blast furnace, after a period of nearly 10 years of inactivity, has again been blown in, according to the London *Iron and Coal Trades Review*. It is located at Choindez. Immediately after the war the decline in demand for pig iron and the difficulty in obtaining coke kept the plant inactive. When demand again revived, the financial situation in countries bordering on Switzerland was such as to permit them to send pig iron into Switzerland for sale at prices below the local cost of production. The iron ores now being used are being taken from the Delsberg Valley and the Gonzenburg works near Sargans. The Choindez plant has a daily capacity of only about 80 tons and employs about 40 men when in full operation.

Germany to Make Beryllium Steel Commercially

HAMBURG, GERMANY, Jan. 19.—Production of beryllium alloy steel, thus far in the experimental stage, is shortly to be placed on a commercial basis. While beryllium has been used as an alloy of aluminum, it is believed among German alloy steel makers that it has a greater future as an alloy of steel. It gives steel the ductility of iron, increases its resistance to corrosion, and improves its quality. Although the steel alloyed with beryllium is expensive, it is lighter in weight than most alloy steels, as beryllium is about the same weight as "Electron," the magnesium alloy. Recently a bridge was constructed of beryllium alloy steel for experimental purposes and, while the results of tests were considered highly satisfactory, the cost of the material is still an obstacle to its more general use.

Old Swedish Steel Works Merged

STOCKHOLM, SWEDEN, Jan. 17.—The Forsbacka Jernverks Aktiebolag at Forsbacka has been merged with the steel companies of the Svenska Handelsbanken Aktiebolag (Swedish Bank of Commerce), which include the Fagersta Bruks Aktiebolag at Fagersta, Klosters Aktiebolag at Langshyttan, Hörndals Jernverks Aktiebolag at Horndal and the Gimo-Osterby Bruks Aktiebolag at Gimo. The new corporation will control about 50 per cent of the Swedish steel production.

The Forsbacka Jernverks A. B. is

one of the oldest iron works in Sweden. At an early period there existed at Forsbacka a forge built by peasants, which was bought in 1651 by the Mayor of Söderhamn. Increases in its capacity were made at various times, so that it now operates four blast furnaces, controls extensive high-grade ore deposits, operates two Bessemer converters and three open-hearth furnaces and has a rolling mill producing tool, drill, machine, shaft, wheel and tire steel and chromium steel tubes.

German Steel Exports in 1927

Destinations Outside Europe Receive One-third of Total—Comparisons with United States

WASHINGTON, Feb. 2.—Exports of iron and steel products from Germany to non-European countries in 1927 aggregated 1,271,994 metric tons, and represented 32.9 per cent of the total exports, amounting to 3,866,947 tons, according to a compilation made by A. C. Thompson of the Iron and Steel Division, Department of Commerce.

With a total of 262,254 tons, rails constituted the largest item of exportation to non-European countries, or those markets in which United States competition is keenest. The rail shipments to non-European countries were 71.4 per cent of the total of rails to all countries, amounting to 367,773 tons. The largest rail shipments went to the Far East, and amounted to 131,634 tons. Of this 80,753 tons went to British India, while 27,382 tons went to the Dutch East Indies and 16,970 tons to Japan. The Americas were the second largest importers of rails from Germany during the year, taking 57,932 tons (Brazil took 22,768 tons) and British South Africa ranked third with 53,049 tons. The United States took 4458 tons.

Bars, rod and angles exported to non-European countries amounted to 248,924 tons, being 30.7 per cent of the total of 811,056 tons of this class of exports to all countries. The Americas took 137,441 tons, of which 67,893 tons went to Argentina. Shipments to the Far East were 104,846 tons, Japan taking 34,174 tons; British India, 26,723 tons and the Dutch East Indies, 23,268 tons.

Exports of plain wire to the restricted area were 182,717 tons, or 45.7 per cent of the total of 399,743 tons of this product shipped to all countries. The Americas took 87,131 tons and the Far East 84,747 tons.

Of the shipments of all products to non-European countries, 570,307 tons went to the Far East, 552,939 tons to the Americas and 148,748 tons to Africa. The largest non-European consuming country was Argentina, which took a total of 206,318 tons. Japan ranked second with 189,090 tons, and British India third with 185,514 tons. The Dutch East Indies was fourth, with 114,129 tons.

Two tables show in parallel columns the shipments of Germany and of the United States to various countries outside Europe. One table gives details by products; the other gives totals by countries of destination, and covers 1928 for the United States, as well as 1927 for both exporting countries.

Iron and Steel Exports from Germany and the United States to Non-European Countries
(In Metric Tons)

Destination	Germany 1927	United States 1927	United States 1928
The Americas	*552,939*	*1,162,199*	*1,886,477*
United States	113,018	.....	.....
Canada (and Newfoundland)	7,573	847,369	1,199,187
Mexico	15,981	83,055	84,424
Cuba	7,851	93,966	66,259
Argentina	206,318	83,698	99,955
Brazil	103,754	71,763	85,242
Chile	24,253	45,355	69,067
Colombia	15,220	60,025	64,728
Peru	16,839	32,722	26,966
Uruguay	14,055	11,575	8,902
Venezuela	6,702	46,398	83,890
The Far East	*570,307*	*535,139*	*720,049*
British India (and Ceylon)	187,370	28,952	25,917
British Malaya	4,200	8,579	6,504
China	35,939	54,704	94,312
Dutch Indies	114,129	35,822	41,378
Japan	189,090	282,657	413,892
Philippines	9,413	64,356	85,577
Australia	9,488	27,097	19,947
Africa	*148,748*	*20,219*	*14,430*
British South Africa	103,294	10,569	7,539
Egypt	22,420	4,629	3,849
Mozambique	4,382	3,888	1,421
Totals	1,271,994	2,017,557	2,620,956

Export Shipments of Certain Steel Products to Certain Markets in 1927
From Germany (Roman Figures); From United States (Italic Figures)
(In Metric Tons)

Destination	Steel Rails	Bars, Rods, Angles	Structural	Galvanized Sheets	Plates and Black Sheets	Plain Wire	Barbed Wire
All Countries	367,773	811,056	66,652	22,963	488,741	399,743	72,552
	180,427	*112,904**	*150,539†*	*154,610*	*296,832*	*36,002*	*53,231*
Canada	0	1,036	0	0	579	1,809	710
	29,681	*66,445**	*123,458†*	*31,569*	*177,187*	*14,684*	*3,639*
Mexico	4,656	319	0	85	2,406	1,231	1,168
	7,868	*859**	*505†*	*8,386*	*2,506*	*3,760*	*4,478*
Cuba	0	3,792	0	0	0	841	1,515
	18,917	*3,221**	*7,593†*	*11,120*	*2,086*	*1,190*	*4,173*
Argentina	5,916	67,893	6,525	3,434	9,076	48,883	7,302
	.....	*361**	*334†*	*9,354*	*1,912*	*7,083*	*6,919*
Brazil	22,768	13,147	6,837	1,049	2,510	18,296	15,652
	23,004	.....	.....	.....	.....	*422*	*9,255*
Chile	2,865	5,730	598	0	0	5,182	1,751
	4,309	*194**	*2,855†*	.....	*6,005*	.....	*959*
Colombia	363	2,323	605	719	23	719	3,334
	3,829	.....	.....	*9,083*	*605*	.....	*4,176*
Japan	16,970	34,174	85	128	37,689	63,908	0
	29,944	*1,623**	*4,657†*	*3,683*	*65,021*	*713*	.....
Philippines	2,206	2,280	0	0	0	187	670
	5,365	.....	.....	*19,308*	*4,898*	*600*	*3,004*

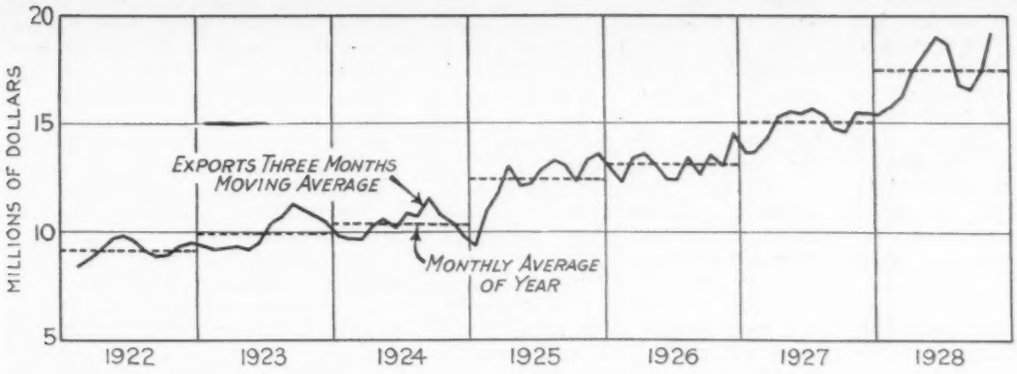
*Bars, only.
†Unfabricated, only.

Business in Imported Steel Continues Quiet

NEW YORK, Feb. 5.—Sales of imported steel for prompt delivery from docks are limited, but small tonnages of bars and shapes have been sold by importers here for spring delivery. Structural grade, plain steel bars are quoted at 1.95c. to 2c. per lb., duty paid, New York, and shapes are unchanged in price at 1.85c. to 1.90c. Importers report difficulty in buying Belgian and Luxemburg steel advantageously since the recent agreement for export among certain Belgian mills and the Acieries Reunies de Burbach-Eich-Dudelange in Luxemburg. While the Continental market is quite firm at present, importers in New York who have recently returned from European business trips report that many steel merchants in European markets look for a slight price recession in the spring.

The test case on the marking of steel with country of origin, scheduled for the middle of December and postponed until the middle of January, has again been moved ahead on the calendar of the Customs Court. Individual cases of reinforcing bar imports on which the bar duty of 30c. per 100 lb. was paid by the importer under protest are being settled, and return of 10c. per 100 lb. by the Government is expected soon. The refunds are being made in conformity with a decision by the Customs Court, Justice Fischer presiding, that reinforcing bars should be classified as construction material, taking a duty of 20c. per 100 lb.

The name of B. F. Jones, founder of the Jones & Laughlin Steel Corporation, Pittsburgh, is to be perpetuated in the $250,000 B. F. Jones Memorial Library, the gift of Mrs. Elizabeth M. Horne, daughter of Mr. Jones, to the borough of Aliquippa, Pa., which will be dedicated on Feb. 1. With its opening the Woodlawn Free Library, which was opened in a room in the Municipal Building, Jan. 3, 1921, will be closed and the books transferred to the new library.



Industrial Machinery Exports for Seven Years, Based on 3-Month Moving Averages. Monthly averages were:

1922	$9,126,363
1923	9,964,606
1924	10,347,026
1925	12,426,336
1926	13,051,528
1927	15,013,932
1928	17,454,068

New High Record in Machinery Exports

1928 Ahead of 1920 by 7½ Per Cent—Industrial Machinery Made a Record, Also —Imports 8 Per Cent Above 1927

WASHINGTON, Jan. 31.—Establishing a new record, exports of machinery of all kinds totaled $497,155,457 in 1928, against the previous record of $462,934,704 in 1920, and $436,348,963 in 1927. Exports of industrial machinery also made a record last year, with an aggregate value of $226,625,962, against $201,455,502 in 1927, according to the classification of the Division of Statistics, Department of Commerce. As classified by the Industrial Machinery Division, exports of industrial machinery last year were valued at $209,448,817, exceeding by 15 per cent similar exports in 1927, with a value of $182,820,451, the previous high having been 1921, with $208,798,000.

Total exports of machinery and vehicles in 1928 for the first time exceeded the billion-dollar mark, aggregating $1,035,415,935 as compared with $857,017,873 in 1927. The record level reached last year was due principally to the increased outgoing movement of both agricultural and industrial machinery. Agricultural machinery imports for 1928, making a record, totaled $116,524,000, against $90,098,000 for 1927.

Exports of machinery in December, with a value of $43,089,522, reflected a decline of $1,545,867 from those of November, valued at $44,645,389.

Industrial machinery exports in

Machinery Exports from the United States

(By Value, in Thousands of Dollars)

	December		12 Months Ended December	
	1928	1927	1928	1927
Locomotives	$11	$639	$3,181	$5,327
Other steam engines	93	47	916	1,361
Boilers	59	117	1,398	1,744
Accessories and parts	42	78	632	668
Automobile engines	596	286	13,026	10,885
Other internal combustion engines	665	463	8,808	7,105
Accessories and parts	269	181	3,501	3,218
Electric locomotives	292	163	1,529	1,321
Other electric machinery and apparatus	916	688	8,298	7,491
Excavating machinery	313	844	6,476	5,392
Concrete mixers	94	88	1,106	1,131
Road-making machinery	212	167	2,801	2,218
Elevators and elevator machinery	436	331	4,786	4,873
Mining and quarrying machinery	1,500	975	14,059	13,286
Oil-well machinery	1,821	870	16,192	16,843
Pumps	1,007	438	8,711	6,314
Bending and power presses	206	159	2,773	1,428
Forging machinery	83	131	955	1,109
Machine tools*	1,315	1,271	15,823	12,500
Rolling machines	32	58	634	542
Other metal-working machinery	716	568	6,703	5,051
Textile machinery	1,066	1,092	12,856	11,466
Sewing machines	750	784	8,605	8,964
Shoe machinery	122	156	1,740	1,718
Flour-mill and gristmill machinery	95	106	582	626
Sugar-mill machinery	200	370	4,692	5,824
Paper and pulp-mill machinery	207	332	3,066	3,823
Sawmill machinery	67	61	920	800
Other woodworking machinery	187	166	2,062	1,485
Refrigerating and ice-making machinery	727	586	8,711	7,454
Air compressors	508	408	6,738	5,873
Typewriters	1,867	2,317	21,010	20,856
Power laundry machinery	140	91	1,274	1,456
Typesetting machines	579	412	4,947	4,504
Printing presses	496	642	6,158	6,251
Agricultural machinery and implements	9,426	6,246	116,524	90,098
All other machinery and parts	15,975	15,886	174,962	155,344
Total	$43,090	$38,217	$497,155	$436,349

*Principal details are shown in another table.

Imports of Machinery Into the United States

(By Value)

	December		12 Months Ended December	
	1928	1927	1928	1927
Metal-working machine tools	$62,182	$22,800	$568,996	$413,821
Agricultural machinery and implements	455,977	362,542	4,839,018	5,406,599
Electrical machinery and apparatus	165,904	123,639	2,771,438	1,772,435
Other power-generating machinery	46,071	6,352	903,014	279,118
Other machinery	1,439,407	621,323	10,648,991	8,106,724
Vehicles, except agricultural	311,322	277,760	3,429,414	2,624,532
Total	$2,480,863	$1,414,416	$23,160,871	$18,603,229

Exports of Power-Driven Metal-Working Machinery

	December, 1928		November, 1928	
	No.	Value	No.	Value
Engine lathes	50	$81,454	76	$111,254
Turret lathes	45	116,780	32	75,368
Other lathes	84	147,360	76	155,461
Vertical boring mills and chucking machines	6	20,587	19	71,987
Thread-cutting and automatic screw machines	82	109,560	71	76,318
Knee and column type milling machines	19	47,254	17	38,058
Other milling machines	47	172,647	66	118,233
Gear-cutting machines	45	102,470	36	99,245
Vertical drilling machines	20	12,138	*810	29,449
Radial drilling machines	5	8,633	4	4,354
Other drilling machines	87	65,634	*287	128,696
Planers and shapers	24	56,293	29	54,552
External cylindrical grinding machines	65	134,653	100	182,058
Internal grinding machines	33	82,703	35	59,563
Metal-working tool-sharpening machines	104	75,432	53	39,391
Total	716	$1,233,598	1,711	$1,243,987

*Probably an error in reporting to Department of Commerce.

December were valued at $19,990,070, against $22,045,468 in November, according to the Division of Statistics.

Exports of power-driven metal-working machinery in December, as listed in THE IRON AGE, totaled 716 in number, valued at $1,233,598. The value in November was $1,243,987, and while the total as reported to the Division of Statistics was given as 1711, this is believed to be incorrect. It is doubted that the listing of 287 "other drilling machines" is accurate; the error is thought to be due in reporting 210 such machines, with a value of only $7,231, as having been exported through Buffalo to Canada; it is believed this should have read 21. And the 810 reported for "vertical drilling machines" is obviously in error.

Imports of machinery and vehicles in 1928 were valued at $29,753,355, compared with $27,517,361 in 1927, while in December incoming shipments were valued at $2,997,070 as against $2,828,258 in November. As listed in THE IRON AGE table imports of machinery in 1928 were valued at $23,160,871, a sharp increase over the preceding year, at $18,603,229. In December these imports were valued at $2,480,863, compared with $2,088,994 in November. Industrial, office and printing machinery imports in 1928 were $18,713,485, against $16,452,625 in 1927. In December they were valued at $2,068,867, compared with $1,718,213 in November.

Metal-working machinery exports showed great activity in 1928, making a gain of 36 per cent over 1927. The exports of last year were exceeded only by those of 1920, an abnormal year. The mining, oil-well and pumping machinery group showed little change of note in export totals. Oil-well machinery did not begin to increase until August, and exports for 1928 were 4 per cent under those of 1927. Mining and quarrying machinery exports made a gain of 7 per cent, due to increased shipments of rock drills and mine hoists and derricks.

The Industrial Machinery Division in a chart has shown the general upward trend of the United States exports of industrial machinery over a period of seven years. It is held to be an effective answer as to whether American machinery can compete with low-priced foreign equipment produced by labor paid much less than American labor. To a great degree these shipments represent equipment of exceptional quality, with the price per pound far above the level usual abroad.

Spiegeleisen Imports Fell Off Last Year

Supplementing data printed in THE IRON AGE, Dec. 27, page 1643, giving imports of spiegeleisen for 10 months last year, the following figures complete the information for the year in gross tons:

	Tons
To Nov. 1, 1928	2,820
November, 1928	1,810
December, 1928	588
Total, 1928	5,218
Total, 1927	7,460

Thus the 1928 imports, largely from Great Britain, were 2242 tons or 30 per cent less than in 1927.

Iron Ore Imports 5 Per Cent Less Last Year

WASHINGTON, Jan. 31.—Declining 135,671 gross tons, imports of iron ore into the United States in 1928 totaled 2,485,046 tons, against 2,620,717 tons in 1927. In December they were 204,799 tons compared with 131,837 tons in the corresponding month of the previous year, but showed a drop from the 223,144 tons of November.

By far the largest imports for both the year and the month came from Chile, being 1,434,860 tons and 113,960 tons respectively. French Africa ranked second for the year, supplying 459,860 tons, and for the month sent 42,230 tons. Cuba furnished 369,286 tons in 1928 and 48,000 tons in December. The order of these three countries, in tonnage received, was the same in 1928 as in 1927. But the Swedish strike caused that country's contribution to drop 89 per cent, falling below both Canada and Spain, which it largely exceeded in 1927.

SOURCES OF AMERICAN IMPORTS OF IRON ORE
(In Gross Tons)

	December		12 Months Ended December	
	1928	1927	1928	1927
Spain	255	.....	37,420	27,165
Sweden	.....	20,178	26,558	244,458
Canada	350	6,405	45,709	26,079
Cuba	48,000	29,500	369,286	392,113
Chile	113,960	61,500	1,434,860	1,369,200
French Africa	42,230	.....	459,860	446,420
Other countries	4	14,254	111,353	115,282
Total	204,799	131,837	2,485,046	2,620,717

World Tin Consumption and Production High in 1928

WASHINGTON, Feb. 5.—Both world production and consumption of tin showed substantial increases in 1928 over the preceding year, according to a report received by the Department of Commerce from Trade Commissioner Homer S. Fox, London, England. Output increased to a greater extent than consumption with a resulting growth in the total visible supplies and a decrease in prices.

Total supplies of tin coming into world markets during the past year amounted to nearly 136,000 tons, approximately 15 per cent more than in 1927. Production in the Federated Malay States was about 10,000 tons larger than in 1927, and 15,000 tons larger than in 1926.

Bolivian shipments were up by about 12 per cent, total 1928 shipments from that country amounting to about 39,000 tons fine, while Nigerian shipments at an estimated total of 8500 tons fine registered an increase of 10 to 11 per cent. Cornish production remained at about the same rate as in 1927, with a total of about 2500 tons for the year.

Compared with this 15 per cent increase in production, total deliveries, representing consumption, were larger by about 9500 tons, or 8 per cent, than in 1927. This increase followed two years in which consumption had been practically stationary and at a slightly lower level than in 1925.

With both output and deliveries at a higher rate but with output in excess of consumption, visible supplies were augmented from 15,474 tons at the end of 1927 to 23,605 tons at the end of 1928. (These figures are the average of the leading trade statistics.) There was a growth in the total visible supply figures in every month but four of 1928, and the increase has been steady since June.

New High Record Made in Steel Furniture in 1928

WASHINGTON, Feb. 1.—Orders for steel furniture in the business group in 1928 were valued at $35,974,117, an increase of $5,213,774 over orders in 1927, valued at $30,760,343. A new high record has been made, displacing the $31,393,171 of 1926. Shipments last year were $35,043,412, a gain of $3,937,623 over those of the preceding year, at $31,105,789, according to reports received by the Department of Commerce from 34 manufacturers.

Orders in December were valued at $3,610,675, against $2,675,664 in November. Shipments in December were $3,117,139, compared with $2,854,312 in November, while unfilled orders were $2,409,985 and $1,916,890 respectively.

Orders in the shelving group in 1928 were valued at $9,601,032, an increase of $1,249,910 over orders in 1927, valued at $7,351,122. Shipments were valued at $9,297,078 last year, an increase of $2,032,796 over those of the preceding year, at $7,264,282, according to reports received from 16 manufacturers.

Orders in December were valued at $828,555, against $875,354 in November, while shipments were $791,376, compared with $915,640, and unfilled orders $757,429 and $720,888 respectively.

Machinery Markets and News of the Works

Deliveries Are Slowing Up

Machine Tool Demand Keeps Ahead of the Ability of Builders to Make Reasonably Prompt Shipments

AS a result of the substantial business they put on their books in January, machine tool builders are in many instances unable to make delivery promises that are satisfactory to prospective buyers. Though many machine tool plants are employing night forces, deliveries have become extended, not only because of the large volume of business recently, but through the inability of shops to keep up to schedules; the great number of absences from working forces on account of illness and a shortage of skilled machinists are contributing factors to this situation. One result of the inability of buyers to obtain equipment when wanted is to quicken the demand for good used tools.

Except for some large orders from the Detroit automobile district, most of the current business is in single machines. One of the developments of recent weeks is an increase in the demand for heavy tools, such as boring mills and planers. A Pittsburgh district steel company has bought two special machines costing $60,000 or more.

The Peerless Motor Car Co., Cleveland, has offered about 300 used tools for sale.

New York

NEW YORK, Feb. 5.—The problem of deliveries of machine tools is becoming more acute, and some orders have been lost in the past week because tool builders could not promise shipment within the time required by buyers. A typical case was the loss of an order when not less than 14 weeks delivery could be promised, whereas the buyer was not willing to wait longer than 10 weeks. The influenza epidemic has set back production in some machine tool plants, and this factor, together with a shortage of skilled machinists, is largely responsible for the failure of manufacturers to catch up with the demand. Sales have continued in good volume, nearly all local agencies reporting January as one of the best months in some time. Inquiries are numerous.

Pioneer Instrument Co., Inc., 754 Lexington Avenue, Brooklyn, manufacturer of aeronautical instruments, has awarded general contract to R. J. Murphy, 1841 Broadway, New York, for two-story addition, including improvements in present plant, to cost about $60,000. R. M. Segal, 475 Fifth Avenue, New York, is architect.

Jack Fein, 1773 Pitkin Avenue, Brooklyn, architect, is completing plans for two-story automobile service, repair and garage building, 145 x 200 ft., to cost more than $100,000 with equipment.

Shell Eastern Petroleum Products Co., affiliated with Shell Union Oil Co., 65 Broadway, New York, has acquired tract of 150 acres at Sewaren, N. J., as site for new storage and distributing plant, reported to cost more than $100,000 with equipment. A refinery is contemplated later.

Department of Mental Hygiene, Capitol Building, Albany, N. Y., is asking bids until Feb. 27 for a mechanical and work shop at State hospital at Brooklyn, as per plans on file at office of commissioner of architecture, 353 Broadway, Albany, and 949 Broadway, New York.

Anchor Cap. Co., 59 East Eighth Street, New York, has acquired American Metal Cap Co., 2 Summit Street, Brooklyn, both specializing in production of metal caps and closures for bottles, jars, etc., and will consolidate. Brooklyn plant will be continued and increased capacity is contemplated.

Ovens, power equipment, conveying and other machinery will be installed in new plant to be erected by Gordon Baking Co., 2303 East Vernon Highway, Detroit, at Long Island City, to cost about $115,000. Pollmar & Ropes, 2539 Woodward Avenue, Detroit, are architects; F. S. Parker, 119 West Fifty-ninth Street, New York, is associate architect.

George G. Miller, 1482 Broadway, New York, architect, has filed plans for a sixty-story automobile service, repair and garage building, 75 x 102 ft., to cost more than $200,000 with equipment.

Superior Ash Can Mfg. Co., 1 Chester Street, Brooklyn, is receiving bids for a one-story addition, 85 x 90 ft., to cost about $40,000 with equipment. I. Kallich, 26 Court Street, is architect.

Board of Education, Yonkers, N. Y., plans installation of manual training equipment in new three-story high school, to cost about $650,000, for which bids have been asked on general contract. G. Howard Chamberlain, 18 South Broadway, is architect.

Indian Refining Co., 17 State Street, New York, operating an oil refinery at Lawrenceville, Ill., is arranging for increase in capital to total about $5,775,000, part of proceeds to be used for expansion in connection with development of its new Havoline oil process.

Sacks-Barlow Co., Inc., 357 Wilson Avenue, Newark, has awarded general contract to Enstice Brothers, 111 Academy Street, for one-story foundry addition.

Smooth-On Mfg. Co., 572 Communipaw Avenue, Jersey City, N. J., manufacturer of cements, etc., will soon take bids on general contract for three-story addition, to cost about $55,000 with equipment. Dodge & Morrison, 160 Pearl Street, New York, are architects.

Standard Oil Co. of New Jersey, 26 Broadway, New York, has plans for three-story addition to oil refining and distributing plant at Bayway, Linden, N. J., 45 x 144 ft., to cost over $70,000 with equipment.

Fawcett School of Industrial Art, 55 Academy Street, Newark, under direction of Board of Education, City Hall, will have plans drawn for three-story school, 102 x 120 ft., to cost more than $200,000 with equipment. Guilbert & Betelle, 20 Branford Place, are architects.

Atlas Fence Co., 35-49 Verona Avenue, Newark, manufacturer of iron fencing, has plans for one-story addition to cost about $25,000 with equipment. A. H. McCully, 60 Schley Street, is architect.

J. L. T. Tillack, 173 Main Street, Hackensack, N. J., architect, has plans for four-story automobile service, repair and garage building to cost about $125,000 with equipment.

Electric Soldering Iron Co., Inc., New York, has removed to larger quarters at 135 West Seventeenth Street.

Lockstrip Mfg. Corporation, 36-09 Vernon Boulevard, Long Island City, N. Y., has taken over manufacture and sales of lockstrip department of Traitel Marble Co., Long Island City, maker of brass and other metal strips used in terrazzo, cement and composition floors. It also manufactures strip for insertion in cement finish of floors.

Chicago

CHICAGO, Feb. 4. — January has closed with a total sales volume equal to that of December and considerably ahead of the first month in 1928. Large inquiries are lacking, but scattered requests for prices are more numerous. Deliveries continue to be pushed into the future and dates of shipments are of growing importance in making sales.

Chicago, Indianapolis & Louisville is in the market for a journal turning lathe and the Rock Island will buy a 6-ft. radial drill and a 6-ft. squaring shear. A hardware manufacturer has ordered two presses and an electrical equipment maker has purchased a 16-in. x 6-ft. lathe. Studebaker Corporation, South Bend, Ind., has placed additional orders with more to follow. Zimmerman Cut Stone Co., 102 East Eighty-ninth Street, Chicago, will build a one-story factory to cost $15,800.

Athey Truss Wheel Co., 130 North Wells Street, Chicago, will erect an addition. Foltz & Co., Chicago, are architects and builders.

Peoples Iron & Metal Co., 5833 Loomis Street, Chicago, will make alterations to its present two-story and basement building, at a cost of $100,000. M. R. Zucco, 39 West Adams Street, is architect.

Lanzit Corrugated Box Co., 2509 West Twenty-second Street, Chicago, has taken title to property at Twenty-fourth and Rockwell Streets, totaling 189,300 sq. ft. land, improved with one-story building for new plant. Structure will be remodeled and addition built, entire project to cost about $175,000. A. Epstein, 2001 Pershing Road, is architect and engineer.

Rogers Brothers Galvanizing Works, Rockford, Ill., will take bids for one-story plant unit at Blue Island, Ill., to cost about $45,000 with equipment.

Feldspar Products Co., Warroad, Minn., has begun construction of new feldspar grinding mill, 35 x 50-ft., with three adjoining structures, to cost about $50,000, with machinery. Rudolph Glatly, Feldspar Milling Co., Burnsville, N. C., is engineer. C. E. Jeffries is engineer in charge at site.

Trap Rock Co., Broadway and K Streets, Minneapolis, Minn., has filed plans for new stone crushing plant, 54 x 60 ft., to cost about $25,000 with machinery. C. J. Bard, Builders' Exchange, is architect. John Wunder is general manager.

Lathrop-Paulson Co., 2459 West Forty-eighth Street, Chicago, manufacturer of dairy machinery, has acquired nearby property, 160 x 120 ft., improved with one-story factory, for expansion.

National Plate Glass Co., Ottawa, Ill., plans rebuilding part of storage and distributing plant destroyed by fire, Jan. 24, with loss reported over $150,000 including equipment.

American Beet Sugar Co., Steel Building, Denver, Colo., is said to be planning to rebuild part of refinery at Belmond, Iowa, destroyed by fire a few months ago, to cost more than $500,000 with equipment. Work will begin in spring.

Galesburg Malleable Castings Co., Galesburg, Ill., has been taken over by American Steel Foundries, Chicago, and will be operated as Galesburg works of that company. Sale was made several years ago, but until now Galesburg company has been operating as independent company. C. H. Bossong continues as manager.

Warchel Corporation, Chicago, has been organized as holding company to acquire capital stock of Ward-Love Pump Corporation, Rockford, Ill., maker of domestic and industrial electric water systems and agricultural, power and rotary pumps; Elite Mfg. Co., Ashland, Ohio, maker of garage and automobile service equipment, and J. H. Channon Corporation, Chicago, manufacturer of heavy hardware and hoisting equipment. Manufacturing activities of Channon corporation will be divided between Ward-Love and Elite factories, which will also continue present lines.

Two additions to plant of E. & T. Fairbanks & Co., Fourteenth Avenue and Eleventh Street, East Moline, Ill., will be erected at once, to be ready for occupancy April 1. Company manufactures wagon, motor truck, farm and produce scales.

The Crane Market

NEW inquiry for overhead traveling cranes is fair, but not so large as usual at this season. Interest in locomotive cranes is rather limited at present, but the New York Central Railroad is reported to be planning to issue inquiries for several cranes during the present year and the Pennsylvania Railroad is expected to issue a formal inquiry soon for 25 or more special crawl-tread cranes of 8-ton capacity. These will be similar to a type of crane of which the Pennsylvania Railroad has bought about 100 in the past two years. Merritt, Chapman & Scott, New York, are reported about to close on a 25-ton locomotive crane. It is reported that the Aluminum Co. of America has placed a number of cranes for installation at its Massena, N. Y., works and that the Youngstown Sheet & Tube Co. has bought the 12 cranes it asked bids on some time ago to serve the new bar mills and open-hearth furnaces at its Indiana Harbor works.

Among recent purchases are:

American Cyanamid Co., 535 Fifth Avenue, New York, 6-ton, 75-ft. span, bucket crane, two 8-ton, 97-ft. span overhead cranes and 10-ton, 29-ft. span overhead crane for Warners, N. J., from Middle Western builder.

Standard Oil Co., Sugar Creek, Mo., 12-ton crawler type crane from Orton Crane & Shovel Co.

Standard Oil Co., Whiting, Ind., 6-ton truck type crane from Orton Crane & Shovel Co.

For export, 6-ton crawler type crane from Orton Crane & Shovel Co.

L. F. Harza, Chicago, 10-ton hoist from Cleveland Crane & Engineering Co.

H. M. Byllesby & Co. for delivery to Mexico, 5-ton hand power crane from H. D. Conkey & Co.

Wagner Electric Co., St. Louis, has ordered three electric cranes of 30-ton, 5-ton and 2-ton capacities from an unnamed bidder.

Western Electric Co., Chicago, 10-ton, 56-ft. span crane and 2-ton, 72-ft. span electric crane from Cleveland Crane & Engineering Co.

International Harvester Co., Rock Island, Ill., 2-ton, 28-ft. span overhead crane from Cleveland Crane & Engineering Co.

Pioneer Equipment Co., Minneapolis, 10-ton, 3-motor, 57-ft. span overhead electric crane from Milwaukee Electric Crane & Mfg. Corporation.

Woodrow Nipple Mfg. Co. and National Nipple Mfg. Corporation, Chicago, have been reorganized and consolidated as Woodrow-National Corporation, with offices at 816 North Spaulding Avenue, and factories at that address and at 1400 West Fortieth Street.

New England

BOSTON, Feb. 4.—In number of tools sold January was the best month experienced by New England machine tool dealers in more than a year. Sales the past week gave February an encouraging start and prospects for the immediate future appear bright. Boston dealers, it is believed, have done better so far in 1929 than those in other sections of New England, although houses in Providence, Hartford, Bridgeport, and Springfield have also made good sales. Competition in new and used tools is unusually keen, however. One local new tool dealer reports the sale of a $30,000 lot of equipment, in addition to smaller transactions.

Good used tools are scarce. Milling machines which sold three months or so ago for $600 and $700 now command $900 to $1,000. A liberal percentage of the used tools sold by Boston dealers the past week went to dealers in the Middle West and included special grinding equipment, drilling tools, milling machines, planers, keyseaters, presses and lathes.

H. W. Bisbee, Cole Road, Hingham, Mass., has plans for a one-story machine shop addition, 90 x 224 ft., at East Boston.

Leonard-Rooke Co., 486 Broad Street, Providence, manufacturer thermostatic valves, contemplates an addition to its plant at Cranston, R. I.

Lockwood, Greene Engineers, Inc., 100 East Forty-second Street, New York, are preparing plans for a mechanical plant for Transcript Publishing Co., 180 High Street, Holyoke, Mass. Motors and conveying equipment will be needed.

I. A. Hopkins, 45 Bromfield Street, Boston, architect, is taking bids for a one-story ice-making plant to be erected by Fisher-Churchill Co., Dedham, Mass. Miscellaneous equipment is specified.

Skyways, Inc., will establish an airport at Wareham, Mass. Hangars and a small machine shop will be erected. Isaac N. Briggs, Parker Mills Road, Wareham, is supervising work.

Franklin Service Stations, Inc., 564 Eddy Street, Providence, will build a one- and two-story service station, 30 x 150 ft. A lathe bench and drilling equipment are under consideration. Albert Harkness, 31 South Main Street, is architect.

Ceco Mfg. Co., Providence, manufacturer of radio tubes and equipment, has plans for two one-story units to adjoin factory recently acquired at Eddy and Chapman Streets, to more than triple present capacity of 15,000 tubes per day, to cost over $100,000. Company has arranged for additional stock issue of about $480,000, to be used in part for new construction and other expansion.

L. J. Thompson, 586 Corbin Avenue, New Britain, Conn., architect, has plans for a two-story cold storage and refrigerating plant to cost about $50,000 with machinery.

Scott & Williams, Inc., Laconia, N. H., manufacturer of knitting machines and parts, is planning four-story addition, 60 x 180 ft., to cost more than $130,000 with

machinery. Work will begin early in spring.

Arrow Electric Co., Hawthorn Street, Hartford, Conn., manufacturer of electric switches and kindred equipment, has plans for two-story addition, 200 x 300 ft., and 180 x 200 ft., to cost more than $100,000 with equipment. Mylchreest & Reynolds, 238 Palm Street, are consulting engineers.

New York Auto Body Co., Meadow Street, Waterbury, Conn., has plans for one-story addition, 60 x 115 ft., to cost about $50,000 with equipment. A. B. Fucito & Sons, 409 Washington Avenue, are architects.

Wright & Corson Co., Milford, Conn., manufacturer of rivets, studs, etc., has acquired tract of 15 acres and plans additional units to cost over $400,000 with equipment. Completion is scheduled early in summer.

Philadelphia

PHILADELPHIA, Feb. 4.—A. O. Thomas, 681 North Fifteenth Street, Philadelphia, operating an electric armature winding and repair works, has plans for two-story plant, 87 x 95 ft., to cost about $25,000 with equipment.

Reading Co., Reading Terminal, Philadelphia, has plans for new unit at shops at Reading, Pa., to cost more than $500,000 with equipment. Portion of structure will be used for equipment storage and distribution, and mechanical handling equipment will be installed. William L. Rice is superintendent at shops.

International Harvester Co., 2905 North Sixteenth Street, Philadelphia, has awarded general contract to Stofflet & Tillotson, Wesley Building, for two-story service, repair and sales building for motor truck division, 110 x 225 ft., to cost $150,000 with equipment.

National Electric Products Corporation, Fulton Building, Pittsburgh, manufacturer of electrical equipment, has leased two-story and basement building at Philadelphia, totaling 21,000 sq. ft. floor space, for new factory branch and distributing plant.

Interests identified with Pennsylvania Railroad Co., Broad Street Station, Philadelphia, have organized Keystone Container Car Co., with capital of $1,000,000, to manufacture all-steel containers to be used on flat cars as well as on motor trucks, etc., for unloading.

Landis Machine Co., Waynesboro, Pa., manufacturer of pipe-cutting and threading machines, will take bids in about 60 days for one-story addition, to cost about $40,000 with equipment. J. Klinkhart, 54 West Washington Street, Hagerstown, Md., is architect.

Philadelphia Storage Battery Co., C and Ontario Streets, Philadelphia, has awarded general contract to Stewart Brothers, 2526 Orkney Street, for one-story shop addition, to cost about $25,000 with equipment.

Golding Sons' Co., Trenton Trust Building, Trenton, N. J., operating feldspar, clay and other raw material properties, is said to be planning to rebuild part of clay-mining and washing plant at Hockessin, Del., destroyed by fire Jan. 25.

Koller Fertilizer Co., Seitzland, Pa., has acquired factory property at Coatesville, Pa., and will remodel for new branch plant. Mixing and other machinery will be installed.

Edison Light & Power Co., West Market Street, York, Pa., is planning expansion in power plants, substations and transmission lines to cost more than $250,000.

Buffalo

BUFFALO, Feb. 4.—Plans are being completed by Wire Wheel Corporation of America, 1700 Elmwood Avenue, Buffalo, manufacturer of automobile wheels, for extensions and improvements in three-story plant unit, to cost more than $65,000. Townsend & McNeil, Dun Building, are architects. H. Gardner Jackson is president.

National Lime, Cement & By-Products Corporation, Mutual Building, Buffalo, has purchased about 250 acres at Tuscumbia, Ala., as site for new plant for production of agricultural lime specialties, flux, etc., to cost about $280,000 with equipment.

J. Howard Rice, 1568 Howard Avenue, Utica, N. Y., and associates have organized Rice Tool & Die Corporation, and plan early operation of local factory. Arthur L. Evans, 2011 Holland Avenue, is also interested in new organization.

Rochester Gas & Electric Co., East Avenue, Rochester, N. Y., is said to be planning new steam-operated electric power plant, using turbo-generating units, to cost over $1,000,000 with transmission line.

Trico Products Corporation, 817 Washington Street, Buffalo, manufacturer of metal stampings, automobile accessories, etc., has acquired adjoining property, 40 x 100 ft., for additional unit.

Houdaille-Hershey Corporation, Buffalo, has been formed to take over and consolidate Houdaille Corporation, 537 East Delevan Avenue, manufacturer of automobile shock absorbers; Hershey Mfg. Co., Chicago, manufacturer of automobile locks, tire carriers, etc.; and Oakes Products Corporation, Indianapolis, manufacturer of kindred automotive products. Consolidated company will continue three plants and carry out expansion program.

South Atlantic

BALTIMORE, Feb. 4.—Plans are being drawn by Consolidated Gas, Electric Light & Power Co., Lexington Building, Baltimore, for three-story top addition to automobile service, repair and garage building to cost more than $250,000 with equipment. Richard Irvin & Co., Vandergrift Building, Pittsburgh, are architects.

Everlastone Products Corporation, 1400 Moreland Avenue, Baltimore, manufacturer of artificial stone specialties, plans one-story addition, 100 x 200 ft., to cost $40,000 with equipment.

Board of Trustees, University of Maryland, College Park, Baltimore, is having plans drawn for three-story engineering building, to cost about $100,000 with equipment; also, for central steam-operated power plant to cost about $175,000 with equipment. Smith & May, Calvert Building, are architects.

John H. Heald Co., Lynchburg, Va., recently formed as consolidation of John H. Heald & Co., Lynchburg, and Mead Paper Board Co., Dayton, Ohio, has work under way on one-story mill, 100 x 680 ft., for production of corrugated paper board products to cost over $150,000 with machinery. Campbell King is construction engineer.

Tidewater Oil Sales Corporation, 11 Broadway, New York, has plans for new oil storage and distributing plant at Baltimore, to cost about $150,000 with equipment.

Golding-Keene Co., Keene, N. H., operating feldspar properties, has acquired land at Toecane, N. C., with feldspar deposits, and is reported planning construction of new grinding mill, to cost more than $65,000 with equipment. Machinery for feldspar mining will also be installed.

Southern States Roofing Co., Raleigh, N. C., manufacturer of metallic roofing products, has leased building at Newark, N. J., totaling about 7000 sq. ft., for Eastern factory branch and distributing plant.

Chevrolet Motor Co., 3044 West Grand Boulevard, Detroit, is reported planning new branch assembling works and distributing plant at Richmond, Va., to cost more than $350,000 with equipment.

Coca-Cola Co., Atlanta, Ga., is said to be completing plans for new bottling plant at Morrilton, Ark., to cost about $70,000 with equipment.

East Coast Utilities Corporation, 105 West Adams Street, Chicago, is reported to have purchased site on French Broad River, near Marshall, N. C., for new hydroelectric power development, to cost about $225,000 with transmission system. Project will be carried out by Northwest Carolina Utilities, Inc., a subsidiary.

Draper Corporation, Hopedale, Mass., manufacturer of cotton mill machinery, has taken title to property at Spartanburg, S. C., totaling 31½ acres, and will use part of site for new factory branch and distributing plant, to cost more than $75,000.

Milwaukee

MILWAUKEE, Feb. 4.—The machine-tool market continues active both in sales and inquiry. Automotive plants furnish the most urgent business, but orders are coming from many other sources. There is also a relatively good export demand. Production is still at the peak and most shops continue to report difficulty in procuring skilled labor.

Hamilton Metalplane Co. and Hamilton Aero Mfg. Co., Milwaukee, divisions of United Aircraft & Transport Co., New York, are active machine tool buyers. Orders have been placed for $65,000 worth of new equipment for Hamilton Aero company, which specializes in propellers, and appropriation has been made for about $100,000 worth of tools for aircraft plant and for further enlargement of propeller works. A new aircraft plant adjacent to Milwaukee Airport will be built. Thomas F. Hamilton is president of both Milwaukee divisions, which are operated separately.

Wisconsin Power & Light Co., 16 North Carroll Street, Madison, Wis., has appropriated $199,500 for power plant extensions at Beloit, work to be started about March 15. A. P. Gale is manager at Beloit.

Stoughton Co., Stoughton, Wis., manufacturer of motorbuses, commercial car bodies and cabs, sleighs and farm wagons, is preparing to add 50,000 to 75,000 sq. ft. to its floor space. Negotiations for existing buildings owned by city are under way, and if these fail new construction will be undertaken. F. J. Vea is president.

Milwaukee Electric Railway & Light Co., 217 Michigan Street, Milwaukee, will spend $1,500,000 in enlargement of its

Lakeside steam generating plant. Boiler house will be extended 92 sq. ft., 103 ft. high, with a 198-ft. stack, and a 40,000-hp. boiler, operating at 1390 lb. per sq. in. pressure, will be installed at a cost of $725,000. John Anderson is vice-president and chief engineer of power plants.

Wisconsin Parts Co., 571 High Street, Oshkosh, Wis., manufacturer of double-reduction gear and other axles, is planning for erection of an addition, to cost about $100,000 with equipment. Company recently became a division of Timken-Detroit Axle Co.

M. E. McCaffrey, secretary Board of Regents, University of Wisconsin, Madison, Wis., will be ready about March 1 for bids for construction of new College of Mechanical Engineering, designed by Arthur Peabody, State architect, Madison. Appropriation is $577,000.

North Western Steel & Iron Works, Eau Claire, Wis., has changed its name to National Pressure Cooker Co. For several years its principal business has been production of steam kitchen devices and the change is made to better identify company with its product.

Turner Steel Co. has opened an office at 605 Commerce Building, 192 Fourth Street, Milwaukee, for consulting engineering, handling Turner system of reinforcing, designing bridges and buildings, and selling of reinforcing and structural steel.

Cleveland

CLEVELAND, Feb. 4.—While machine tool business slowed down somewhat during the latter part of the month, the January volume was good. Dealers' sales were close to those in December. A leading manufacturer of turret lathes reports that he sold more machines in January than in the previous month. Demand for boring and drilling machines from the automotive industry was not so active in January as late last year, but some makers have enough business to keep their plants filled up until April.

Machine tool sales the past week were mostly for single machines. Inquiry, also largely for single tools, improved over the previous week. Slow delivery on some lines of new tools is stimulating demand for good used machinery. The Peerless Motor Car Co., Cleveland, has placed 300 used tools on the market through a local dealer.

Northern Blower Co., West Sixty-fifth Street and Barberton Avenue, Cleveland, manufacturer of dust collecting equipment, is enlarging its plant by an addition, 75 x 125 ft.

Plans are being completed by Pipe Machine Co., 930 East Seventieth Street, Cleveland, for one and two-story addition, 35 x 50 ft. and 40 x 48 ft., to cost about $45,000 with equipment. Kalsch & Hoefler, 4500 Euclid Avenue, are architects.

Toronto Paper Mfg. Co., Toronto, Ohio, is planning expansion including installation of machinery to increase present capacity about 25 per cent, to cost $100,000. James H. Cayford is vice-president.

Board of Education, Bridgeport, Ohio, is considering installation of manual training equipment in new two-story high school to cost about $200,000, for which bids will soon be asked on general contract. C. W. Bates, Hawley Building, Wheeling, W. Va., is architect.

Cleveland Electric Illuminating Co., Illuminating Building, Cleveland, has authorized plans for extensions in generating station at Avon, to increase capacity to 187,000 hp., to cost over $1,500,000.

Libbey-Owens Sheet Glass Co., Toledo, Ohio, is said to have plans for another unit, to cost more than $2,000,000 with machinery. Lockwood, Greene Engineers, Inc., 400 North Michigan Avenue, Chicago, is engineer.

Packard Electric Co., Warren, Ohio, manufacturer of transformers, cables, etc., has arranged for increase in capital from 47,000 to 200,000 shares of stock, no par value, large part of fund to be used for expansion.

Cuyahoga Cold Storage Co., 3542 Croton Avenue, Cleveland, has filed plans for three-story and basement cold storage and refrigerating plant, 80 x 85 ft., to cost more than $130,000 with equipment. A. A. Soffen, Engineers' Building, is engineer.

Board of Education, Fremont, Ohio, contemplates installation of manual training equipment in new senior and junior high school to cost $200,000, for which plans will be drawn by S. H. Shively & Son, Longan Block, architects.

Cincinnati

CINCINNATI, Feb. 4.—Machine tool bookings the past week held to the level which has prevailed since the first week of January. Again the automobile industry has supplied a substantial percentage of the total business, the outstanding order having been for special lathes costing over $200,000. These machines are for delivery to an automobile company which is preparing to produce a new model.

A notable development of the past few weeks has been the increased demand for heavy tools, such as planers and boring mills. A steel company in the Pittsburgh district has purchased two large special machines involving an expenditure of from $60,000 to $70,000. An Eastern company bought several lathes from a local builder which totaled $30,000. Automobile body makers at Detroit are reported to have other tools to purchase before their equipment expansion program is completed. There have been no sizable transactions in foreign business. The Amtorg Trading Corporation, however, is expected to buy considerable equipment.

Black-Clawson Co., Second and Vine Streets, Hamilton, Ohio, manufacturer of paper mill machinery and parts, is said to be planning one-story addition, to cost more than $45,000 with equipment, work to begin in spring.

Board of Education, Middletown, Ohio, has authorized bond issue of $900,000 for two junior high schools and plans installation of manual training departments. Architect will soon be selected to prepare plans, to be ready for bids in about 90 days.

Wilmington Oil Co., Wilmington, Ohio, plans rebuilding of portion of gasoline storage and distributing plant destroyed by fire, Jan. 26.

Henry Fischer Packing Co., 1860 Mellwood Avenue, Louisville, plans one-story automobile machine and repair shop, 75 x 170 ft., to cost more than $30,000 with equipment, to include drill press, lathe, milling machine, and other tools.

National Cash Register Co., Dayton, Ohio, has plans for six-story addition, to cost more than $160,000 with equipment, and will begin superstructure as soon as possession is taken of Ellis Adding Typewriter Co., Newark, N. J., recently acquired.

Kentucky Utilities Co., Louisville, is disposing of bond issue of $8,150,000, part of fund to be used for extensions and improvements in power plants and system, including acquisition of Kentucky Hydro-Electric Co., operating hydro-electric generating station on Dix River, near Lexington, Ky.

Southern Signal Co., 2017-19 Portland Avenue, Louisville, is planning to rebuild portion of plant recently destroyed by fire.

Columbus Aircraft Corporation, Columbus, Ohio, care of A. J. Frye, 767 North Fourth Street, is said to have plans for one-story parts and assembling plant at Columbus airport, to cost more than $40,000 with equipment.

Pittsburgh

PITTSBURGH, Feb. 4.—While no outstanding machine tool business was placed in January there was a steady flow of small orders and inquiry was well sustained. In heavy equipment, interest centers in the blooming mill, plate mill and two bar mills for the new plant of the A. M. Byers Co. at Ambridge, Pa. Work on the program of the National Tube Co. at McKeesport, Pa., is said to await the granting of the appropriation.

Bessemer Gas Engine Co., Grove City, Pa., and C. G. Cooper Co., Hamilton and Mount Vernon, Ohio, are negotiating a merger which is expected to be completed soon. Both companies manufacture oil and gas engines and accessories.

Plans are being arranged for expansion by Pittsburgh Screw & Bolt Corporation, Preble Avenue, Pittsburgh, to include facilities for production of thread protectors, propeller blades, hubs and other airplane parts, in addition to present line of manufacture.

Latrobe Electric Steel Co., Latrobe, Pa., manufacturer of castings, etc., is considering one-story addition to cost about $60,000 with equipment.

Pierpoint Motor Co., 5001 Baum Boulevard, Pittsburgh, has filed plans for two-story service, repair and garage building, to cost about $125,000 with equipment.

Carnegie Refining Co., Heidelberg, Pa., is having plans drawn by H. S. Bell, Woolworth Building, New York, consulting engineer, for rebuilding part of oil refinery recently destroyed by fire.

Lovell Mfg. Co., Erie, Pa., manufacturer of washing machines, wringers, etc., has acquired hand-operated wringer branch of American Wringer Co., Woonsocket, R. I., and will consolidate. It is purposed to remove division to main plant at Erie, which will be enlarged.

Hunting-Davis & Dunnells, Century Building, Pittsburgh, architects, have asked bids on general contract for four-story automobile service, repair and garage, to cost more than $150,000 with equipment.

Pittsburgh Coal Co., Oliver Building, Pittsburgh, is disposing of bond issue of $20,0000,000, part of proceeds to be used for expansion and improvements in coal-mining and affiliated plants. W. G. Warden is chairman of board.

Detroit

DETROIT, Feb. 4.—Bids have been asked on general contract by Liberty Starter Co., West Fort and Minnie Streets, Detroit, manufacturer of automobile starting and lighting equipment, for four-story addition, 30 x 120 ft., to cost about $100,000 with equipment. Pollmar & Ropes, 2539 Woodward Avenue, are architects.

Briggs Mfg. Co., 11631 Mack Avenue, Detroit, manufacturer of automobile bodies, has leased about one-half of plant of Ford Motor Co., Highland Park, including group of nine buildings, for manufacture of bodies for Ford automobiles.

Prest Metals Co., Marysville, Mich., is having plans drawn by G. L. Harvey, Federal State Bank Building, Port Huron, Mich., architect, for two-story unit, 50 x 68 ft., for production of pressed metal goods, to cost about $30,000 with equipment.

Packard Motor Car Co., 1580 East Grand Boulevard, Detroit, has plans for four-story top addition to building No. 92, to cost more than $400,000 with equipment. Albert Kahn, Inc., Marquette Building, is architect and engineer.

Murray Corporation of America, Inc., Russell and Aberle Streets, Detroit, manufacturer of automobile bodies, has expansion under way for production of 2500 bodies per day. Superstructure has been started on one-story press unit, 250 x 425 ft., for manufacture of steel stampings; also for a one-story L-shaped assembling building, 350 x 525 ft., and 100 ft. wide. Two units will cost about $1,000,000 with equipment. Foundations will soon be laid for branch mill at Memphis, Tenn., to cost $4,000,000 with machinery.

Flint Ornamental Iron & Wire Works, Flint, Mich., will soon begin superstructure for one-story unit, to cost $40,000 with equipment. George J. Bachman, Pengelly Building, is architect.

Fruehauf Trailer Co., 10940 Harper Avenue, Detroit, manufacturer of motor trailers, parts, etc., has taken bids on general contract for one-story addition, 150 x 160 ft., to cost over $90,000 with equipment. Albert Kahn, Inc., Marquette Building, is architect.

Upton Machine Co., St. Joseph, Mich., has work under way on one-story addition, 60 x 100 ft., to cost about $40,000 with equipment.

Indiana

INDIANAPOLIS, Feb. 4.—Board of Public Works, Fort Wayne, has rejected bids recently received for municipal electric light and power plant, to cost more than $50,000 with equipment, and will have revised plans prepared at once.

Davis Aircraft Corporation, Richmond, organized by Walter C. Davis and associates, has leased local plant of Richmond Piston Ring Co. for airplane works, including parts and assembling departments. Company has acquired plant and property of Vulcan Aircraft Co., Portsmouth, Ohio, and will remove to Richmond where production will be concentrated. Mr. Davis will be president and general manager.

Evansville Malleable Castings Co., 2549 East Colm Street, Evansville, contemplates one-story foundry addition, to cost more than $25,000 with equipment. L. P. Edwards is general manager, in charge.

J. D. Adams Mfg. Co., Indianapolis, has been formed under State laws to take over and succeed J. D. Adams & Co., with local plant at 217 South Belmont Avenue, manufacturer of road-building machinery and parts. Company plans expansion and has disposed of stock issue to total about $300,000, portion of fund to be used for such purpose. Factory branches are maintained at Kansas City, Mo., Dallas, Minneapolis, Spokane and other points.

Fort Wayne Brake Service, 611 South Lafayette Street, Fort Wayne, has leased one-story building, 40 x 100 ft., to be erected at 326 East Berry Street, for new service and machine works, to cost about $30,000 with equipment. Simpson Parkinson, 209 East Wayne Street, is architect.

United States Radio & Television Corporation, operating Case radio works at Marion, Ind., is planning establishment of another local unit for its Apex radio works, now at Chicago. It is proposed to remove Apex plant to Marion and install additional equipment.

Wright-Tuttle Aircraft Motors Corporation, Anderson, has been organized to manufacture aircraft motors and has taken over buildings formerly occupied by International Rubber Co. V. L. Wright is president; C. E. Tuttle, vice-president, and C. M. Swoger, secretary.

South Bend Tool & Die Co., South Bend, recently organized to manufacture die tools and special machinery, has begun construction of factory at 1900 South Main Street, to cost with equipment $100,000. Building is expected to be ready for operation in March. J. P. Huckins will head new company.

St. Louis

ST. LOUIS, Feb. 4.—Bids will soon be asked by Mobile & Ohio Railroad Co., Fullerton Building, St. Louis, for engine house and shops at East St. Louis, Ill., to cost more than $175,000 with equipment. C. A. Heyes is company architect; B. A. Woods is chief engineer.

Missouri Clay Mining Co., 411 North Seventh Street, St. Louis, C. L. Gray, president, is considering new mining, washing, storage and distributing plant near Poplar Bluff, Mo., to cost about $150,000 with equipment.

Board of Public Service, St. Louis, O. D. Tillay, secretary, will receive bids until Feb. 13 for one 10-ton box girder electric crane for fire department repair shop, Municipal Service Building, Contract No. 3486.

Travel Air Co., Wichita, Kan., has been formed to take over and expand Travel Air Mfg. Co., with local plant to manufacture single-motored airplanes, monoplanes, etc.

George B. Prinz, Omaha National Bank Building, Omaha, Neb., architect, has plans for five-story and basement automobile service, repair and garage building to cost about $350,000 with equipment.

Lincoln Aircraft Co., Inc., Lincoln, Neb., recently formed with capital of $50,000 and 125,000 shares of stock, no par value, will take over and succeed to plant and business of local company of same name. Expansion will be carried out, to include production of light training and other kindred airplanes, in addition to line of heavy commercial aircraft. Victor H. Roos, formerly treasurer and general manager of Swallow Airplane Co., Wichita, Kan., will be president and general manager of new organization.

St. Joseph Structural Steel Co., St. Joseph, Mo., will proceed with construction of four one-story units, 55 x 100 ft., 40 x 100 ft., 20 x 100 ft. and 40 x 80 ft., to increase present floor space more than 50 per cent. Crane runway will be built. Entire program will cost more than $80,000 with equipment.

Trans-Continental Air Transport, Inc., St. Louis, care of Love-Sultan, Inc., 6625 Delmar Boulevard, architect, has plans for airport buildings at Dodge City, Kan., including hangar, with repair and reconditioning shop, to cost about $50,000 with equipment.

J. B. Klein Iron & Foundry Co., Oklahoma City, Okla., sends corrected information regarding expansion. Its engineers are now preparing plans for a steel fabricating plant, 100 x 350 ft., with storage yard. Later in year company will build a reinforcing steel fabricating shop, 75 x 200 ft., ornamental iron shop, 100 x 200 ft., gray iron and non-ferrous foundry building, 70 x 100 ft., warehouse, 75 x 200 ft., and office building, 50 x 150 ft., two stories. Company will move from present location at 1004 West Second Street to new plant at Fourth and Blackwelder Streets as soon as first unit of new plant is completed. R. W. Robertson is president; C. A. Lord, engineer; William Klein, superintendent; C. L. Bullock, assistant superintendent.

Gulf States

BIRMINGHAM, Feb. 4.—Reed Roller Bit Co., Mack Avenue, Houston, Tex., has authorized two one-story additions to oil equipment manufacturing plant, 75 x 225 ft., and 75 x 100 ft., first noted to be equipped as machine shop, and latter for general mechanical, storage and distributing service; also for two-story office, 40 x 110 ft. Extensions will be used in connection with removal of business of Barrett-Robinshaw Co., Beaumont, Tex., manufacturer of kindred equipment, recently acquired, to Houston, and are reported to cost more than $80,000 with equipment.

Gulf Oil Corporation, Frick Annex, Pittsburgh, has acquired property near Sweetwater, Tex., and contemplates new oil refinery, to cost more than $400,000 with equipment.

Maverick County Water Improvement District No. 1, Eagle Pass, Tex., is arranging fund of $1,800,000 for hydroelectric generating plant and transmission system, in conjunction with irrigation works.

Ozark Chemical Co., Ritz Building, Tulsa, Okla., has acquired tract near Pecos, Tex., for development of sulphur properties, with plant for production of sulphuric acid, to cost more than $200,000 with equipment.

City Council, Abilene, Tex., is planning bond issue of $100,000, fund to be used for a municipal airport, including hangars, repair shop, oil storage and other buildings. W. A. Biney is city engineer, in charge.

Southern Concrete Tile Co., Pensacola, Fla., is considering branch plant at Rome, Ga., with main unit, 250 x 300 ft., to cost more than $100,000 with machinery.

Morriss Aviation Industries, Inc., 1010 Burt Building, Dallas, Tex., recently organized with capital of $200,000 by William Morriss and associates, has acquired property of Dallas Aviation Industries, Inc., including shops, hangars, etc., and buildings of Dallas Aviation School, both located in Love Field dis-

trict, and will convert for manufacture of aircraft, including training planes and commercial airplanes. Additional equipment will be installed. Mr. Morriss is president, and William F. Long, vice-president and general manager.

Maston S. Nixon, Nixon Building, Corpus Christi, Tex., and associates are planning two-story automobile service, repair and garage building, 100 x 135 ft., with foundations for three additional stories, to cost more than $100,000 with equipment.

Thermo Fire Brick Co., Sulphur Springs, Tex., recently reorganized with capital of $100,000, has plans for extensions and improvements to double present capacity of plant, to cost more than $45,000 with equipment. Charles Cobb, Jr., is president.

American Battery Products Corporation, Denver, Colo., C. V. Chernendy, president, is planning establishment of branch plant at Wichita Falls, Tex., and will lease local building.

C. B. Davis Engineering Co., Brown-Marx Building, Birmingham, has been appointed district turbine sales representative for Murray Iron Works Co., Burlington, Iowa, engineer, founder and boilermaker.

Pacific Coast

SAN FRANCISCO, Jan. 30.—Contract has been let by Automatic Tension Screen Co., Los Angeles, to Siegel & Son Construction Co., 1520 South Orchard Street, for one-story plant, 120 x 570 ft., to cost about $85,000 with equipment.

City Council, Lodi, Cal., has purchased power site on Mokelumne River, near Lancha Plana, and plans construction of municipal hydroelectric power plant, to cost more than $150,000 with transmission lines.

Emil Arrup, Los Angeles, has plans by Edward C. and Ellis W. Taylor, 810 West Sixth Street, architects, for one-story boat-building works, to cost about $24,000 with equipment.

Boiler, Tank & Pipe Co., Hollis Street, Piedmont, Cal., is planning one-story boiler and plate shop at Oakland, to cost about $50,000 with equipment.

San Diego Consolidated Gas & Electric Co., San Diego, Cal., is arranging for stock issue of about $3,000,000, part of fund to be used for extensions and improvements in power plants and transmission system, including new service and equipment repair building.

Willard Storage Battery Co., East 131st Street, Cleveland, is reported planning new assembling plant near Stockton, Cal., to cost more than $125,000 with equipment. J. A. Kasper is district distributer at Stockton.

Portland Furniture Mfg. Co., Portland, Ore., is planning new unit to total about 30,000 sq. ft. floor space, to cost over $75,000 with equipment.

Consolidation of hoist manufacturing business of Electric Steel Foundry, hoist and lumber carrier business of Willamette Iron & Steel Works, and entire manufacturing activities of Ersted Mfg. Co., all of Portland, Ore., has been effected by incorporation of Willamette-Ersted Co. All manufacturing of new company will be handled at Ersted plant, 918 Clackamas Street. Other companies participating will continue independently in lines along which they have been operating, which are not in competition with new organization.

C. F. Pease Co., Chicago, maker of blue-print machinery and drafting room supplies, has opened Pacific Coast sales office at 501 South Spring Street, Los Angeles, under direction of Ralph S. Gibson, Western sales manager.

Flickinger, Meyers & Rudolph, 129 West Second Street, Los Angeles, have been appointed district turbine sales representatives for Murray Iron Works Co., Burlington, Iowa.

Canada

TORONTO, Feb. 4.—Builders and dealers report a steady flow of orders from one to a half dozen tools, with inquiry for larger lists. The automotive and railroad rolling stock manufacturers are the principal buyers at present. Large orders have recently appeared for power development projects, pulp and paper mills and mining plants.

E. Leonard & Sons, Ltd., manufacturer of engines, boilers, etc., is making improvements to its plant and will build an addition to boiler shop. A 20- to 25-ton electric traveling crane and other equipment will be installed.

J. & J. Taylor, Ltd., Toronto, manufacturer of safes, vaults, etc., is spending about $100,000 on additions and equipment.

L. A. Young Industries of Canada, Ltd., Windsor, Ont., manufacturer of wire products, etc., is contemplating a plant addition.

Clark Metals, Ltd., Listowel, Ont., manufacturer of casters, automobile hardware, etc., is planning to double present capacity.

Beach Furniture Co., Ltd., Cornwall, Ont., is planning an addition to factory which will double present capacity.

Eastern Steel Products, Ltd., Preston, Ont., is completing addition, 48 x 140 ft.

Dominion Department of Trade and Commerce, Ottawa, has let contract to Thunder Bay Harbor Improvement Co., Fort William, Ont., for foundation work for $4,000,000 grain elevator and docks at Prescott, Ont. C. D. Howe & Co., Whalen Building, Port Arthur, Ont., are engineers.

St. Thomas Metal Signs, Ltd., St. Thomas, Ont., is having plans prepared by J. T. Finlay, 430 Talbot Street, for an addition to cost $30,000.

Day Name Plates, Ltd., 4 Woodfield Road, Toronto, will have plans prepared by Chapman & Oxley, Sterling Tower Building, for a factory to cost $35,000. Construction work will not start until spring or summer.

Trussed Concrete Steel Co., Walker Road, Walkerville, Ont., will build a one-story addition, 30 x 156 ft.

Servel Corporation, Ltd., 51 East Forty-second Street, New York, has awarded contract to Hoffman Construction Co., for a factory at Ford, Ont.

Bids will be called about Feb. 15 by Niagara Falls Water Commission for a power house and filtration plant in Queen Victoria Park, Dufferin Islands, to cost $500,000. Plans are by F. A. Dallyn, 71 King Street West, Toronto.

Canadian Rogers Sheet Metal & Roofing Co., are contemplating an addition and installation of new equipment in its Toronto plant.

Western Canada

Car shops of Canadian National Railways at Melville, Sask., were destroyed by fire Jan. 29.

Manitoba Rolling Mill Co., which purchased an 18-acre site at Calgary, Alta., is having plans prepared for erection of a plant to cost $400,000, construction work to start in spring.

Tait Pipe & Foundry Co., Ltd., Vancouver, B. C., is making additions and changes in its plant, including installation of a monorail system.

Vancouver Kraft Co., Ltd., Port Mellon, B. C., a subsidiary of Columbia Paper Co., will spend $1,500,000 on erection of lumber, pulp and paper mills for manufacture of kraft paper.

Foreign

MUNICIPALITY of Lourenco Marques, Mozambique, Africa, is planning installation of coal loading and unloading equipment, and information regarding types and cost of American machinery is desired, quotations c.i.f. Lourenco Marques. Information at office of Bureau of Foreign and Domestic Commerce, Washington, reference Portuguese East Africa No. 297648.

American & Foreign Power Co., under direction of Electric Bond & Share Co., 2 Rector Street, New York, is planning construction of hydroelectric generating plant at Micos Falls, Mexico, with transmission lines to Mexico City, Monterey and vicinity, project to cost more than $5,000,000.

Intercontinents Power Co., operated by Gannett, Seelye & Fleming, Inc., 602 North Second Street, Harrisburg, Pa., has disposed of a preferred stock issue totaling $1,485,000, part of fund to be used for extensions and improvements in electric light and power properties in Argentina and Chile, including acquisition of additional power plants and systems.

Royal Baking Powder Co., 100 East Forty-second Street, New York, is planning construction of new branch plant in South Africa, to cost more than $250,000 with machinery.

Commanding officer, Hawaiian Ordnance Depot, Honolulu, T. H., will receive bids until Feb. 23 for quantity of non-climbable steel wire mesh fence, cyclone type, circular 2.

Pan-American Airways, Inc., 100 East Forty-second Street, New York, is planning construction of one or more airports in British West Indies, and sites are under consideration at Nassau, Bahama Islands, Jamaica, and other ports, to include hangars, repair snops, oil storage and other buildings, to cost more than $150,000. John A. Hambleton is vice-president.

Electricity Commissioners for Midlands District, Birmingham, England, have authorized construction of super-power electric generating plant on River Severn, at Ironbridge, Shropshire, with initial unit to cost about £960,000 ($4,800,000). West Midland Joint Electricity Authority has been empowered to secure loan of £700,000 ($3,500,000) to proceed with work. Project will develop about 200,000 kw., and is estimated to cost £3,000,000 (about $15,000,000).

Skoda company, of Czechoslovakia, has bought extensive property in Madrid, Spain, which is to be transformed into foundries, according to press statements, says the Department of Commerce through Commercial Attache C. A. Livengood, Madrid.